UNIVERSITY OF PENNSYLVANIA

PIEDRAS NEGRAS POTTERY

MARY BUTLER

A DISSERTATION

IN ANTHROPOLOGY

PRESENTED TO THE FACULTY OF THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

THE UNIVERSITY MUSEUM
UNIVERSITY OF PENNSYLVANIA
PHILADELPHIA
1935

PIEDRAS NEGRAS POTTERY

A DISSERTATION

IN ANTHROPOLOGY

PRESENTED TO THE FACULTY OF THE GRADUATE SCHOOL OF THE
UNIVERSITY OF PENNSYLVANIA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

MARY BUTLER

Reprint of
Piedras Negras, Preliminary Report No. 4

THE UNIVERSITY MUSEUM
UNIVERSITY OF PENNSYLVANIA
PHILADELPHIA
1935

R. UNIV.
BIBLIOTHEEK
LEIDEN

PIEDRAS NEGRAS PRELIMINARY PAPERS

NUMBER 4

PIEDRAS NEGRAS POTTERY

I. Vessels
II. Figurines, Ornaments, and Miscellaneous Objects

by

Mary Butler

THE UNIVERSITY MUSEUM

UNIVERSITY OF PENNSYLVANIA

PHILADELPHIA

1935

CONTENTS

List of Plates iii

PART I: POTTERY VESSELS

Introduction 1

Polychrome Wares 3

Polychrome A-1 3
Polychrome A-2 3
Polychrome B 4
Polychrome C 4
Polychrome C-1 5
Polychrome D 5
Polychrome D-1 6
Polychrome E 6
Miscellaneous Polychrome 7
Dark-on-light Orange 8
Dark-on-light Red 8

Monochrome Wares 8

Orange Miscellaneous 8
Orange 1 9
Orange 2 9
Orange 2a 10
Orange 3 10
Yellow 11
Mottled 12
Red Miscellaneous 12
Red 1 12
Brown Miscellaneous 13
Brown 1 13
Brown 2 13
Black Miscellaneous 13
Black 1 14
Black 2 14
Unslipped 14
Household or Storage Vessels 14
Cache Vessels 15
Censers 15
Miniature Vessels 16

Table of Decoration in Relation to Ware 16

Conclusions 17
Characteristics of Piedras Negras Pottery 17
The Historical Value of Pottery in the City; Stratigraphy 18
Relations to Pottery from Other Parts of the Maya Area 24

Note on Pottery from the 1933 Excavations 28

Appendix: Qualitative Petrographic Analysis of Potsherds
by A. Williams Postel 29

PART II: POTTERY FIGURINES, ORNAMENTS, AND MISCELLANEOUS OBJECTS

Introduction 41

Figurines

Human Figurines, Mould-made 42

Style X 42
Headform A 42
Headform B 44
Headform C 45
Miscellaneous 45
Style Y 46

Human Figurines, Modelled 46

Animal Figurines, Mould-made, Style X 47

Animal Figurines, Modelled 47

Personal Ornaments 47

Miscellany 48

Conclusions 49

Note on Figurines Recovered in 1933 53

Appendix: Detailed Description of Figurines, Ornaments, and
Miscellaneous Objects 53

Bibliography 66

LIST OF PLATES

PART I: POTTERY VESSELS

Plate I Polychrome sherds showing geometric and naturalistic designs.

II Polychrome sherds showing geometric designs.

III Polychrome sherds showing geometric designs: variations of scroll, and glyph forms.

IV Sherds showing incised, carved, and modelled decoration.

V Sherds and miniature vessels; sherds illustrating ways in which applied indented fillet is used for decoration.

VI Vessels

VII Vessel shapes, actual and reconstructed, in their relation to wares.

VIII Vessel shapes, actual and reconstructed, in their relation to wares.

IX Vessel shapes, actual and reconstructed, in their relation to wares.

X Map of the Maya area, showing distribution of tempering materials, and number of sherds tested from each site.

XI Part of the plan of the city of Piedras Negras, showing locations of pottery test pits.

PART II: POTTERY FIGURINES, ORNAMENTS, AND MISCELLANEOUS OBJECTS.

Plate XII Human figurines with Form A heads.

XIII Human and animal figurines, personal ornaments, and miscellaneous objects.

XIV Human and animal figurines, personal ornaments, and miscellaneous objects.

VESSELS

INTRODUCTION

The pottery from Piedras Negras consists of that from general excavation, of value mainly for comparative study, and that from test pits which were dug for the purpose of trying to establish a ceramic sequence. Half of the pottery recovered during the field seasons of 1931 and 1932 is in the Museum at Guatemala City; half is on loan at the University Museum in Philadelphia. This paper is based on a study of all the pottery from the 1932 season, and that half of the 1931 pottery which was lent to the University Museum. A note on the outstanding features of the 1933 pottery will be found on page 28. The small amount of material recovered in 1934 is not yet available for study.

Pottery classification is, in the last analysis, reduced to one of two main criteria:- decoration or shape. Piedras Negras pottery is here classified on the basis of decoration, since most of the material is so fragmentary that a study of shape is to a large extent reduced to one of rim form, indicative of, but not defining, the entire vessel.

A qualitative petrographic study, by Mr. A. Williams Postel of the Geology Department of the University of Pennsylvania, of the composition of the clays from which Piedras Negras pottery is made, establishes three groups of tempering material:- calcite, calcite with a slight admixture of quartz, and quartz. Thirty-nine of the forty-seven sherds analysed were tempered with calcite or with calcite and quartz. The other eight sherds were quartz-tempered, and confined so far to three wares. This quartz group subdivides into two types:- One in which the quartz is unevenly graded (Red 1,Black 1), the other in which it is fine, evenly graded and in high proportion (Orange 3). The sherds tested from Jonuta show the same type of quartz tempering as the Piedras Negras Orange 3 group, but so much less quartz is present in each sherd that it is safe to distinguish the two types on the basis of quantity of tempering material.

The surface hardness of Piedras Negras wares varies only from 2 to 3; the porosity ranges from 9.8% to 26.3%, without apparent relation to other criteria. As far as one can judge petrologically, the firing temperature was under 700°C.

The terms used are defined as follows:

Ware ("the sum of articles of a particular kind or class"-- Webster) is determined by slip color, although some groups or subgroups that are also homogeneous in clay composition and degree of firing are more fully defined.

Slip is used for the finer surface coat of clay wash, usually colored, applied to a vessel; paint refers to color decoration supplementary to this.

Negative painting, unless otherwise specified, includes both "true" and "false" techniques. In the former, following Lothrop's definition (1926 a, pp. 144-5), the design itself is painted in a protective substance, presumably hot wax, over which a coat of a darker pigment is applied; a subsequent melting of the protective substance reveals the lighter design. In the "false"

technique, the darker background is painted around the light design.

Capitalized names of colors refer to those used in Robert Ridgway's Color Standards and Color Nomenclature, Washington, 1912. Shapes have been classified as variant forms of bowls, dishes, plates, and jars.

Bowl. A vessel, the diameter of which is equal to or greater than its height, having the main zone of decoration on the outside.

Dish. A vessel, the diameter of which is greater than its height, having the main zone of decoration on the inside. While the distinction between bowl and dish may seem unduly arbitrary, and may lead to calling by one name vessels which seem to deserve the other, it does serve to give a definite meaning to each of these terms, often used loosely and even synonymously.

Plate. Like a dish, but very shallow.

Jar. A vessel, the height of which is greater than the diameter, having the main zone of decoration on the outside.

Bevel is "the angle which one surface makes with another when they are not at right angles" -- Webster; (Pl. VIII, 33; IX, 47).

Flange ("external or internal rib or rim" -- Webster) is used for horizontal external projecting rims or ribs, other than the vessel rim, running continuously around a vessel; flanges are distinguished as labial, (Pl.VIII, 32); medial, (Pl.VIII, 31, 35 - 37); basal, (Pl. IX, 59).

Ring base. A ring of clay attached to the base of a vessel (Pl. VII, 11; Pl. VIII, 34).

Ring foot. A high, flaring circular base attached to a vessel (Pl. VI, 17 - 19).

Dish indentation. A flat circular depressed area in the outer surface of a vessel base (Pl. VIII, 42).

Numbers used after the names of shapes refer to the series drawn in three plates following the first part of this paper, VII, VIII, IX.

The scale used in the illustrations shows intervals of one centimeter.

The following abbreviations are used in Part I:

MAI Museum of the American Indian, Heye Foundation, New York, N. Y.

PM Peabody Museum of American Archaeology and Ethnology, Cambridge, Mass.

UM University Museum, Philadelphia, Pa.

POLYCHROME WARES

Polychrome A-1.

Colors:[1] Background, Morocco Red; design, Xanthine Yellow, White.
Paste: Tempered with calcite[2]. Buff-Pink to Vinaceous Tawny.
Shape: Bowls: 53, 54
Dishes: 39
Jars: 3
Plate: 41
Decoration: Negative painting only. Slight predominance of interior decoration.
Design: Geometric circles and variations of the circle (Pl.I, 1, 2); stripes; broad S-shaped lines (Pl.I, 6).

The main characteristic of this group is the use of negative painting as the sole method of decoration. The technique is usually the "true" one; where, however, white and yellow are both used in the design elements, there is a possibility of the final red layer having been applied by the "false" method. This group definitely establishes true negative painting as a technique is use during the Maya Old Empire.

It is a technique that depends on silhouette for its effect, and is therefore limited to fairly simple, stylized designs. While the S-lines are so used to suggest stylized animal or insect forms, the other designs are purely geometric, simple silhouettes well adapted to the technique, and almost entirely confined to this group. This ware has to our knowledge been found so far only at Piedras Negras.

Polychrome A-2.

Colors: Background, dark brown[3], or black; design, white or Mars Orange.
Paste: Tempered with calcite. Vinaceous Tawny.
Shape: Bowls: 53? (Body pieces only).
Decoration: Negative painting. Exterior decoration.
Design: Disks (Pl. I, 7).

Although only three sherds decorated in this manner have been found at Piedras Negras, they are of real importance, since similar sherds have been found at other Maya cities. A sherd from Hochob, in Yucatan (AMNH), and a tripod bowl from Copan, with polychrome painting inside (PM), have on the outside the same negative-painted disk decoration. While Copan is, like Piedras Negras, an Old Empire city, Hochob is considered, because of its architecture, to belong to the Transitional Period.

---

1 The advice of Mr. Henry B. Roberts of the Carnegie Institution of Washington has been useful in laying out the plan of this report.

2 For full reports of petrological examinations, see Appendix, p.29.

3 Since this specimen was lost in a fire at the camp, it is impossible to give the exact shade.

Polychrome B.

Colors: Background, Morocco Red; design, Xanthine Yellow, white, black.
Paste: Tempered with calcite-and-quartz. Vinaceous Tawny, sometimes banded with black.
Shape: Bowls: 53, 54
Dishes: 39
Jars: cylinder, 16; narrow-necked, 5.
Plates: 41
Foot: round rattle, 72.
Decoration: A design, applied by a negative painting technique, serves as background for the main design, executed in black outline. Slight predominance of exterior decoration.
Design: Geometric -- (Pl. I, 8) including glyphforms (Pl. III, 11); naturalistic -- human heads (Pl. I, 14); snake heads (Pl. I, 15,18).

The geometric designs are more elaborate than those of Group A. The two vigorously drawn human heads recall codex face numerals. This type of polychrome seems to be an elaboration of the pure negative painting of Group A by the addition of line drawing to a silhouette technique.

Polychrome C.

Colors: Morocco Red, Mars Orange, Xanthine Yellow, white, black. Yellow-orange, black and white on a red background; or red, black, and white on an orange-yellow background.
Paste: Tempered with calcite. Onion skin Pink, Terra Cotta.
Shape: Bowls: 53, 54, 42
Dishes: 38, 39, 60
Plates: 41
Jars: cylinder, 16; narrow-necked, 2, 3.
Lids: 53
Feet: 67, 71
Decoration: The basic technique is black-outlined mass painting, with occasional use of negative painting for details. Exterior decoration predominates.
Design: Geometric:- including glyphs (Pl. III, 5, 8), Year-Bearer Symbol (Pl. II, 1, 2), stepped fret (Pl. II, 12), simple stepped design (Pl. II, 11), running scroll (Pl. III, 3), checkerboard in brown and white (Pl. II, 3), designs suggesting textile technique (Pl. II, 9-10), and amorphous ones difficult to classify (Pl.I, 5). Naturalistic:- including two definite (Pl. I, 9,11) and one possible human figures, a parrot wing (Pl. I, 13), and elaborately rendered snakes (Pl. I, 12; VI, 4).

There are, in this group, marked variations in treatment, but only one style with enough examples to warrant considering it as a sub-group. It will be described as C-1. The examples of figure painting belong to what may be called the Chamá style. This is a style of painting scenes with human figures in them that is associated with the Chamá section of the Guatemalan Highlands, and is distinct in character from the styles of similar polychrome vessels from Honduras, Salvador, and the Peten. A red

background with this type of polychrome is rare. It occurs on the Piedras Negras sherd shown in Plate I, 11; it occurs on a cylinder jar in the Chamá style fron Uaxactun (Smith, Pl. 5), and on a cylinder jar from the Highlands on which, as on one white Piedras Negras sherd, turquoise blue is used. The early date painted on the Uaxactun jar is no criterion of the age of the vessel, since the stratification at Holmul indicated that such cylinder jars did not appear in the Peten before the Holmul V period. The Piedras Negras sherds have the design on the outside, and belonged to cylinder jars or straight-sided bowls. The scarcity of this type of design at this city, and its contrast to the abstract character of most of the polychrome decoration there, suggests that the sherds mentioned are trade pieces from the Highlands.

Polychrome C-1.

Color: Background, Morocco Red; design, Xanthine Yellow, white, black.
Paste: Tempered with calcite-and-quartz. Onion-skin Pink.
Shape: Plate: 41
Jar: narrow-necked, 4
Lids: 53 (Pl. III, 9)
Decoration: On the red exterior is a yellow or white band parallel to the rim, on which broken-down glyph blocks are painted in black, each block being subsequently painted red. The inside has an indecipherable design painted in black on yellow with red overpainting of masses.

Sherds of this kind occur most frequently in the Southeast section of the city.

Polychrome D.

Color: Background, Mars Orange; design, Morocco Red, Black.
Paste: Tempered with calcite. Onion-skin Pink.
Shape: Bowls: 53
Dishes: 33 - 37, 39, 62
Jar: 11
Decoration: Line painting in red and black in a bold and vigorous style which lacks the finish and delicacy of workmanship found in Group C. Negative painting is used for detail on two sherds only. The orange slip is sometimes laid directly on the vessel, sometimes over a primary white slip. In the first case, the paste seems to be more finely mixed, and the tempering material is less evident. This distinction cannot be correlated with differences in styles or shapes, and has at present no apparent significance.
Design: Geometric designs are relatively simple. There is a stepped fret (Pl. II, 13) similar to one in the Polychrome C group (Pl.II, 12), an imitation of the negative-painted oval design characteristic of Polychrome A (Pl. I, 4, 1), a repeated curved line (Pl. III, 4) and broken-down glyph forms (Pl. III, 6, 7, 10). There is the

the use of dark orange vertical bars in pairs on an orange background around the outside of a flat-based tripod dish with slightly flaring walls decorated inside in polychrome (63); Naturalistic:- parrot wings (Pl. I, 10), snake head (Pl. I, 17).

The parrot-wing fragment recalls, in simplicity of treatment and shape of rim, the parrot bowls with basal flange from Holmul I and from the Highlands, where, at Chihuatal (UM), they occur in the early level. The bar decoration in dark-on-light orange is found on polychrome tripod dishes from British Honduras (MAI) similar in shape to the Piedras Negras dish (63), and on polychrome pottery drums from Yalloch (PM). It occurs on the outside of a dish (54, rim 38) with mottled interior from under the floor of the throne room of J-6. The walls of this room are dated approximately by the throne, 9. 17. 15. 0. 0[4] but the floor may be one or even two building-periods earlier (See Piedras Negras Preliminary Report, Number 3); the decoration was therefore in use well before that date. It occurs on dark-on-light orange ware, found in the earlier part of O-13, a building on which the latest date yet found is that of Lintel 3, 9. 16. 10. 0. 0 (?).

Polychrome D-1.

Color: Background, Mars Orange; design, Bay.
Paste: Tempered with calcite. Ochraceous Salmon.
Shape: Dishes: 35, 39
Decoration: Outline painting, on inner wall of dish.
Design: Broken-down glyphs. Dot surrounded by an elongated circle with projections at the ends (Pl. I, 16), which may have naturalistic derivation.

This small group is found in the Southeast section of the city. The brown may be overfired red.

Polychrome E.

Color: Background, Mars Orange; design, Maroon Red, Black.
Paste: Tempered with calcite. Light Ochraceous Salmon.
Shape: Bowls: 53
Dishes: 35, 39
Plates: 34
Decoration: Usually outline painting in maroon, with the design elements sometimes filled with an orange wash slightly deeper than that of the background. One bowl has an all-over mat design done in false negative painting (Pl. VI, 1). Interior decoration predominates.
Design: Geometric-- scroll (Pl. III, 1), broken-down glyphs (Pl. III, 12-14), mat design (Pl. II, 8).

---

4 Monument dates used are those worked out by Dr. S. G. Morley of the Carnegie Institution of Washington.

Most of the sherds of this small group come from the Southeast section of the city. Maroon red decoration on orange, with the occasional addition of black, is charactistic of early Copan pottery. Two of the Piedras Negras sherds (Pl. III, 1, 14) have design elements that are identical with those on vessels from Copan I (Vaillant, 1927), dated by a deposit under Stela I at that site as being earlier than 9.12.5.0.0. One of these sherds comes from the lowest level of a pit in front of Pyramid K-5.

The most interesting pieces of this ware are the only two that have come from the South Group. These are two bowls, with disk indentations in the exterior base (Pl. VI, 1,2). The shape is a frequent one at Piedras Negras; the bowls, thin-walled, are of fine buff paste, and light in weight. They were found as lid and vessel containing a cache of flint and obsidian, in the South Ball Court. One has an all-over mat design (Pl.II, 8), where the braid element is shown in orange with two fine maroon lines in it, on a maroon background. This design is a characteristic element of the polychrome pottery of Salvador and the Ulua Valley, and occurs at Copan. A braid with two inner lines does not seem to occur north of Salvador, and the Piedras Negras design is done with more delicacy than in any of the specimens to the south. The companion bowl has a glyph-derived decoration (Pl.III, 12, 13) that suggests a development from the glyph bands of Copan I. Neither shape, ware, nor style of decoration of these two bowls, however, fits into the pottery scheme of Copan, Salvador, or the Ulua Valley, though design elements and colors seem to come from Copan. A possible explanation is a Piedras Negras copy of Copan work. The two sherds similar to Copan I, on the other hand, are probably trade pieces; the remaining sherds of this group are either trade pieces or Piedras Negras copies. Though the scarcity of the ware, apparently introduced early, implies the former, the two South Group bowls point to at least one local potter influenced by Copan. A possible extension of this influence may be shown in a bowl with an all-over braid decoration in Morocco red on orange (Pl. II, 7).

Miscellaneous Polychrome.

A. Of several sherds with white background, one had a design in red, black, and blue, another had a stylized red line design, with edge and vertical panel lines of black (Pl. VI, 5) and the third,from J-6, had lost its stylized flower design and been redecorated by a brown line. One sherd had a yellow design on a brown background, with a band of blue at the rim. An effigy owl-head lid, from a South Group test pit, was originally painted with a polychrome design (Pl. IV, 9).

B. Pots-fired Painting. There is one example of post-fired polychrome painting in black, red,and orange, on a coarse, unslipped bottle-necked jar with a band of circular reed or bone marks on the neck. This is the only occurrence of either technique on Piedras Negras pottery (Pl. V, 1).

C. Stucco. There are two polychrome sherds of uncertain provenience that have been covered with stucco painted pink and green. (See Linné, Appendix 2).

Dark-on-light Orange.

Color: Mars Orange.
Paste: Tempered with calcite or calcite-and-quartz. Light Ochraceous Salmon.
Shape: Dishes: tripod 61, 63 (Pl. VI, 10)
Jars: cylinder, 16 (Pl. VI, 3); narrow-necked, 2, (Pl. VI, 9)
Feet: 67a
Censer handle or spout.
Decoration: Painted in wide lines in a heavier, darker coat of the orange background slip.
Design: Crude geometric on jars; pairs of vertical bars on dishes.

With the exception of dish and cylinder jar sherds from the earlier part of O-13, which can be dated as before 9.16.10.0.0(?) recognizable pieces of this ware have appeared only in the South section, in the debris associated with Pyramid R-3. There is reason for thinking that R-3 was not abandoned while the city was occupied, (Unpublished Piedras Negras Preliminary Report on R-3, Appendix 1), which would suggest that vessels found in the debris fallen from the temple were made late in the occupation of the city. The shape of the tripod dish illustrated recalls the tripod dish form characteristic of Holmul V (Merwin and Vaillant, Pl. 29, a), the latest pottery period at that Old Empire site. From the stylistic point of view, the type of decoration and the careless workmanship in both modelling and painting suggest a degeneration of better executed ware, possibly standard polychrome.

Dark-on-light Red.

Color: Morocco Red.
Paste: Tempered with calcite-and-quartz. Salmon Color.
Shape: Bowls: 53 (Pl.VI, 11)
Jars: 2.
Decoration: Painted in wide lines in a darker, heavier coat of the red background slip.
Design: Crude geometric.

There are only a few examples of this ware, from the South Group. Stylistically, it is similar to dark-on-light orange, and is probably contemporaneous with it.

MONOCHROME WARES

Orange Ware, Miscellaneous.

Color: Mars Orange to Xanthine Yellow.
Paste: Tempered with calcite. Color ranges from Salmon, with low-polished slip closely related in color and texture, to Apricot Buff with a basic white slip under a secondary well-polished orange one (see Polychrome D). There is no correlation of this with shape or supplementary decoration.

Shape: Bowls: 51, 55
Dishes: 36, 37, 39, tripod, 35, 59
Plates: 34, 41
Jars: 14; narrow-necked, 3-5; with right-angle shoulder, 7; tripod, 9.
Lids: 65
Flanges: medial 35-37
Feet: round rattle, on bowls, 82; teat, on plates, 67, 76
Decoration: Incising (Pl. IV, 11-13; VI, 6); vertical fluting, concave, 52; applied band at rim, 51; smoothing the outer unslipped rim of plates in a band two centimeters wide around the edge, and roughening the surface below.

Fluted and banded bowls occur also in yellow and mottled wares. Orange ware is one of those most frequent at Piedras Negras and is most plentiful in the West Group. An incised bowl (Pl. VI, 6) was found on the floor of J-12. It is one of the few pieces of pottery recovered intact, and implies that incised orange ware was in use at the end of the city's occupation, if the buildings on the Acropolis were not abandoned before that time. The variation in slip application referred to above cannot at present be considered as significant, but there are four small sub-groups of orange ware that stand out from the mass, and may have historical significance. These will be referred to as Orange 1, 2, 2a, and 3.

Orange 1.

Color: Mars Orange.
Paste: Thick, coarse, tempered with calcite. Light Ochraceous Buff.
Shape: Bowls: 21, 28-31
Jars: narrow-necked, 3.
Decoration: Occasional lines and triangles in black.

This corresponds to a type of ware often called Lacquer from the combination of a coarse, thick paste with a fine, polished slip. Examples are infrequent, and in poor condition.

Orange 2.

Color: Mars Orange; slip apparently stick-polished; occasionally shows imprint, left by lime deposit, of a loosely-woven plain-cloth textile (Pl. V, 7).
Paste: Tempered with calcite; firm, well-fired. Onion-skin Pink.
Shape: Bowls with lids: 43-45 (Pl. VI, 7-8)
Plates: 41

This might be called Votive Orange Ware, since almost all the vessels made of it are associated with caches in Temple O-13, K-5 and in the South Ball Court playing field. It does not occur in association with the Ball Court structures R-11. Three of the four sets of vessels from K-5 were found one under each of the three column altars. These altars were found in each of three superimposed buildings of which the latest is given a

tentative date of 9.12.5.0.0. Though we do not know the length of time covered by the three buildings, we can consider the ware to have been in use at least two K-5 building periods earlier than 9.12.5.0.0. A plate was found with Burial 5, which probably belongs to the second half of Cycle Nine. Bowl 45 has a similar bowl inverted as its lid. The textile imprints imply that these vessels when deposited, had been wrapped in a piece of cloth, probably to hold vessels and lids together, and keep intact the offering of jade, shell, sting-ray spines, eccentric flints and obsidians. Similar bowls, tied with a strip of cloth, are shown on a polychrome cylinder jar from Uaxactun (Smith, Pl. 5). Red-orange bowls of shape 45 occur in pairs also at Uaxactun (Ricketson, OG., pp. 308-9) and at Holmul in the Peten (Merwin, Vaillant, Pl. 19, f; 27,h), at Mountain Cow in British Honduras (Thompson, fig. 10, c) and at Quen Santo in the Guatemalan Highlands (Selev, 1901, pp. 99, 107). Bowl 43, and its lid, appear in polychrome among "Mayoid" material in Ecuador (Uhle, Pl. XIV, 38).

Orange 2a.

Color: Ferruginous to Kaiser Brown. Slip seems to have very low polish.
Paste: Tempered with calcite. Light Ochraceous Salmon.
Shape: Lidded Bowl 43
Plates: 41
Dishes: 35

This is characterized as a separate sub-group by the color and quality of its slip. The examples are few in number, and may be due to the individual treatment of Orange 2 by one craftsman. An argument against this is the varied shapes and scattered locations of the sherds that we have. A fragment of a plate was found beneath a stone three meters under the floor of K-5-3d, beneath two vaulted and one non-vaulted structures, and is therefore presumably of quite early date at the city. Another plate was found as part of a cache beneath the floor of one of the front rooms of Q-13, a building approximately dated by Lintel 3 as 9.16.10.0.0(?). The lidded bowl held a cache beneath Altar 1 to which Dr. Morley assigns tentatively the latest date at the city 10.0.0.0.0(?). While the distribution of these specimens suggests that Orange 2a, like Orange 2, was used over a long period of time, it must be remembered that the later vessels could have been preserved from an earlier period. There are not yet enough vessels of this ware to warrant definite conclusions on this point.

Orange 3.

Color: Mars Orange
Paste: Tempered with quartz. Fine. Apricot Buff.
Shape: Bowls: 46, 49, 50
Decoration: Low-relief carving (Pl. IV, 4); champ-levé (8), through white slip on jar necks and bowls (Pl. IV, 3, 8); gadrooning, 50; incising on bowl interiors.
Design: Carving:- human figures; champ-levé, incising:- geometric.

This ware corresponds to that sometimes described as "fine orange". It occurs only in the debris around R-3, and R-11 in the South Ball Court. One Maroon Red sherd from P-7 has the same distinctive paste. The pottery from R-11 corresponds to that from R-3 which, from its position, has been considered contemporary with the end of the city's occupation. There are various outside associations for Piedras Negras vessels of this ware most of which tend to support the suggestion of a relatively late date for it. A broad, low bowl with disk indentation in the base (51) has the outside surface completely carved with scenes showing human figures below a border of debased glyphs. Another such bowl comes from Yaxchilan (PM) and a third from Kixpek in the Highlands (UM). Carving on bowl sides in a similar style comes from Mound 36 at Copan (PM), but the ware is different. A gadrooned, or convexly-fluted, bowl (52) is duplicated in the Ulua Valley (PM).

The most interesting shape is a bowl with short, bulging sides, tripod feet, and an incised design on the floor (46). Vessels similar to this come from Jonuta (UM) on the Usumacinta between Piedras Negras and the Gulf, and one such comes from Kixpek in the Highlands (UM). At Piedras Negras, this type of bowl is found only in the South Group. It occurs only in this orange ware, and in a brownish low-fired ware (Brown 2), of which two similar bowls are almost the only examples (Pl. VI, 15, 16). In orange ware, the incised decoration is in groups of parallel lines, as in Mexican grater bowls. The Jonuta sherds are of fine, well-fired, light orange paste, unslipped, polished, and with two lines incised around the outside of the rim, parallel to the edge, cutting through a simple, geometrical border painted in thin black. One sherd of characteristic Piedras Negras orange ware shows an imitation of this Jonuta rim, with a single incised line.

Several rim sherds from Piedras Negras that may have been parts of such bowls have a variation in shape in a recurved side (49), that recalls bowls from the Chiriqui region of Panama; a similar sherd, of similar paste, comes from mounds in the Vera Cruz district (PM). One of those from Piedras Negras has a champ-levé design on the outside of the rim, which is covered with a thick white slip (Pl. IV, 8). Such a cutting of a design through a white slip to an orange background characterized a type of ware from the Isla de Sacrificios, near Vera Cruz. Another sherd from Piedras Negras shows this treatment applied to the bottle neck of a jar. Similar sherds come from Yaxchilan, and from Copan (PM).

Yellow Ware.

Color: Capucine to Mikado Orange.
Paste: Tempered with calcite. Salmon Buff.
Shape: Bowls: 52-53
Jars: narrow-necked, 4
Feet: High, roughly cylindrical, 69
Decoration: Fluting; banded rim.

This ware is infrequent at Piedras Negras.

Mottled Ware.

Color: Usually mottled, ranging from Mars Orange, through Chestnut to Black.
Paste: Tempered with calcite or calcite-and-quartz. Ochraceous Salmon, Light Ochraceous Salmon.
Shape: Bowls: 47, 52, 56, 59
Dishes: 36
Jars: wide necked, 10
cylindrical with slab feet, 17
small, flat (Pl.V, 5), 8
Feet: round, 72-73; slab, with cylinder jars, 77.
Flanges: medial, 36; basal, 59
Decoration: Champ-levé (Pl. IV, 2); modelling and incising (Pl. IV, 6); fluting, (52); incising.
Design: Geometric for champ-levé and incising; naturalistic, an owl head, for the modelled and incised sherd.

This ware is frequent at Piedras Negras. It may very well be orange ware so fired by a reducing technique as to produce the dark surface, mottled from orange to brown or black. This cannot definitely be determined without chemical tests. The one small "perfume bottle" with flattened sides comes from the Southeast Group. There are several examples of a low cylindrical jar with slab feet from the trench in the West Group Plaza. This is a type of vessel that is often thought of as Toltec; the Piedras Negras specimens, however, do not bear any more direct resemblance to Toltec jars than they do to footed cylinder jars from the Ulua Valley, and their early occurrence at Piedras Negras does not suggest a Mexican derivation.

Red Ware, Miscellaneous.

Color: Morocco Red.
Paste: Tempered with calcite-and-quartz. Apricot buff.
Shape: Bowls: 53, 54.
Dishes: 39
Jars: 15
Plates: 34, 40
Lid: 53
Feet: with plate, 78

Red ware is uncommon at this site. A unique sherd, from P-7, painted maroon red, has the hard-fired orange paste and quartz tempering characteristic of Orange 3, and a short ring foot. This is the only example of a ring foot in Piedras Negras pottery aside from censers (Pl. VI, 17-19).

Red 1.

Color: Morocco Red.
Paste: as Orange 1, but quartz-tempered.
Shape: Bowls: 21.

Brown Ware, Miscellaneous

Color: Bay
Paste: Tempered with calcite. Ochraceous Salmon, Light Ochraceous Salmon. Occasional use of hard-fired, gray or gray-brown pastes, (Drab Gray).
Shape: Dishes: 31, 35
Jars: cylinder, 15; with wide necks, 11.
Plates: 40
Feet: With plates, 78

This ware is infrequent. One large cylinder jar shows a surface of stripes alternately painted brown and gray (Pl. VI, 14).

Brown 1.

Color: Bay
Paste: as Orange 1
Shape: Bowls: 53
Dishes: 35
Jars with bevelled shoulder: 6
Decoration: Occasional crude black lines and triangles painted on the rims of dishes.

Brown 2.

Color: Benzo-Brown
Paste: Tempered with calcite. Light Ochraceous Buff.
Shape: Bowl: 48 (Pl. VI, 15, 16)
Decoration: Interior incising.
Design: Leaf-like pattern, enclosed in a circle, placed askew in the floor of the bowl.

Almost the only examples are two bowls from R-11, in the South Ball Court, presumably late. The surface finish is applied thinly and sketchily enough to be called a wash rather than a slip. A similar bowl, lacking only the incised design, comes from Kixpek in the Highlands, (UM). The shape of the bowl, resembling that of so-called grater bowls, which have functional incised patterns on the inside of the bowls, suggests that this is a type developed from the grater bowl in which the functional incising has degenerated into meaningless decoration.

Black Ware, Miscellaneous.

Color: Black
Paste: Tempered with calcite.
Shape: Jars, wide-necked, 10-12 (Pl. VI, 12)
Bowls: 42, 53
Decoration: Incising, stepped rim (Pl. V, 3)
Design: Geometric.

The color of this ware is apparently due to carbonization of the vegetal matter in the slip. Black ware is rare at Piedras Negras.

Black 1.

Color: Black
Paste: Fine, hard, thin. Tempered with quartz. Congo Pink, Onion-skin Pink. Occasional use of Drab Gray paste, hard-fired and thin.
Shape: Bowls: 42, 53
Lids: 53
Decoration: Punctate lines; incising.

Infrequent. The color is probably due to carbonization of vegetal matter in the slip. A decorated bowl comes from the altar niche of the superstructure of K-5.

Black 2.

Color: Black
Paste: Tempered with calcite-and-quartz. Thick, coarse. Vinaceous Tawny
Shape: Bowls: 53
Dishes: 66 (Pl. VI, 13)
Jar with bevelled shoulder: 6

The color is due to the "smudging" technique, carbonizing the vessel itself, which is low-polished, and may or may not have a slip. The vessels are all thick and heavy, and occur chiefly in the debris around R-3 and R-11 in the South Group, which would suggest that they are late. One bowl sherd from R-11 has a curved scratched line on it that suggests the top of a human profile. This is more apt to be graffito than intentional contemporary decoration.

Unslipped Ware.

Color: Japan Rose to Light Quaker Drab.
Paste: Tempered with calcite. Rufous to Light and Pale Ochraceous-Buff.

Almost all unslipped vessels from Piedras Negras fall under one of three headings determined by function.

I. Household or storage vessels:

Shape: Bowls: 21-28, 32
Dishes: 45, 54
Jars: 18, 20: with narrow neck, 1.
Decoration: Striation; slashed applied knobs at the base of a jar neck (1); indented fillets (22, 31, 32; Pl. V, 8-13); bowls often painted black, brown, red or orange inside; all-over nail-marking (Pl. VI, 19).

Design: Striation sometimes done in diamond-shape pattern.

II. Caché vessels.

Shape: Jars: 10, 13, 19, (Pl. VI, 20-22)

Decoration: Pear-shaped jars often have a blue edge painted around the rim of the jar and the edge of the lid.

Such vessels, holding offerings of jade, eccentric flints and obsidians, have been found in quantity in the rear room of Pyramid O-13; one came from P-7, one from J-2, and the single lidded jar with constricted neck (10) was found in J-6.

III. Censers.

a) Ladle. Three rather crude handles of ladle censers (64) were recovered, two coming from Structure R-1, the other from near Stela 8. One of those from R-1 had a very crude snake and a man or monkey applied at the end of the tubular handle, and had originally been painted blue. Gamio illustrates a similar censer from the Highlands (1927, vol. 23, p. 133).

b) Effigy. There are some sherds from Structure O-13 which seem to have been pieces of effigy censers, but none is complete enough to warrant an attempt at identification.

c) Spiked. There are fragments of whitewashed spiked censers (Pl. VI, 18), 57, recalling those found in the Highlands of Guatemala, in Vera Cruz and Oaxaca. The only complete lid has a vent through the center of the flattened knob on top, with cruciform grooves in the rounded top of the handle. All but three of these sherds come from the rear room in O-13; the exceptions are from the West Group, two of them from J-2, one from in front of the base of Stela 9, 9.15.5. 0.0.
Fragments of two small jars, apparently tripod (58), have a row of spikes down the side, ending in a pointed foot.

d) Lacandon. In Structures J-2 and J-4 of the Acropolis were found several relatively recent Lacandon incense-burners in the form of dishes, each with a crude human head, presumably a god, applied at the edge (Pl,VI, 17). One of these was decorated with a bird head instead of a human one.

IV. Miniature vessels.

Besides the mottled "scent bottle" from the Southeast Group (Pl.V, 5), there are two tiny unslipped jars with perforated lugs on the shoulders (PL. V, 4), one from the East Groups, the other from the south. These may have been children's toys.

A large proportion of the pottery recovered is in sherds that were probably once slipped but are now so badly weathered that they cannot be identified. Interesting specimens of these include a straight-sided bowl, carved with human figures, and three small round lids with crooked projecting handles, two, with traces of blue paint, from Burial 5 in the West Group, the other also from the West Group, with a cruciform design incised on top. There are two objects, bearing moulded on the front what seems to be the standing figure of a jaguar-headed man with a long necklace. These are so rounded on the ends, and project at such an angle from the fragments of vessel side to which they are attached that they cannot have been intended as legs; they most resemble the handle-vents on the side of Toltec bowls discussed by Linné (pp.114-15). The Piedras Negras specimens, however, have no vents; they may have served as handles, or merely as ornaments on the rim of a vessel. These are referred to and illustrated in the Miscellaneous Pottery Section of this report. (Pl. XIII, 24).

DECORATION IN RELATION TO WARES.

Decoration	Ware								Remarks
	P	O	Y	M	R	B	Bk	U	
Modelling	X			X					Effigy, owl-head, lid, Pl.IV,9; owl head,Pl.IV,6.
Carving		X							Pl. IV, 4
Champ-levé		X		X					Pl. IV, 2, 3, 8
Incising		X		X			X		Pl. IV, 1, 5, 11-13
Punctate							X	X	Pl. IV, 7
Reed or bone marking								X	Pl. V, 1
Striation								X	Sometimes diamond pattern
Applied heads								X	Pl. IV, 10, human
Applied indented fillet					X	X		X	Pl. V, 8-13
Spikes								X	Pl. VI, 18

P = polychrome wares
O = orange ware
Y = yellow ware
M = mottled ware
R = red ware
B = brown ware
Bk= black ware
U = unslipped ware

Shape in relation to ware is shown by plates VII - IX.

CONCLUSIONS

The Characteristics of Piedras Negras Pottery

Piedras Negras pottery is a definite ceramic unit, of which the outstanding feature at present is the prevalence of negative painting. One-third of the polychrome group is decorated entirely by negative painting, presenting designs of dots, circles and wavy lines in varying combinations, in orange-yellow and white on a red background (Polychrome A). A similar class uses this technique with the addition of black outlining to emphasize or elaborate the design (Polychrome B). A third style uses negative painting as a subordinate element in elaborate four-color designs, usually in yellow, white and black on a red background (Polychrome C). The "true" negative painting technique is usually employed in Polychrome A and B, although even there it is sometimes used together with the "false". Vessels decorated by negative painting alone were limited to simple designs that could be done in silhouette (Pl. I, 1, 2, 6, 7). The additional line painting that, in adding finer details, produced elaborate designs may have suggested the direct painting-in of the dark background that we call "false" negative painting. Perhaps, then, we have this technique as a direct development from true negative painting, as well as an imitation of it, as suggested by Lothrop (1926, a, p. 145).

Piedras Negras pottery definitely establishes true negative painting as a technique used during the Maya Old Empire. True negative painting occurs sporadically from Jalisco, Mexico, to Peru, (Lothrop 1926, a; Noguera: Jijón y Caamaño), and presumably has northern South America as its center of diffusion. The only places in the Maya area where it may at present be considered as a characteristic of pottery decoration are at Piedras Negras on the Usumacinta, and in the Chamá district of the Guatemala Highlands (UM). The Highland examples range from crude geometric designs in red-on-black to elaborate geometric and naturalistic patterns in white-on-black. There is no connection in design or coloring between this style of negative-painted decoration and that characteristic of Piedras Negras. Two unusual jars from Holmul bear negative painting in white-on-black designs that resemble those from the Chamá district (Merwin & Vaillant, Pl. 28, a, c-f). In shape they resemble another group of jars from the same district (Hirtzel, fig. 27-33). On the other hand, negative-painted disks on a sherd from Hochob, and on the outside of a tripod vessel from Copan, belong to a class of polychrome of which a few examples have been found at Piedras Negras (Polychrome A-2). It seems, then, as though there might have been two centers of diffusion for this technique in the Old Empire, one on the Usumacinta, the other in the Chamá district. Since comparatively little is known about Maya Old Empire pottery, it seems better not to attempt any historical conclusions from the scanty data that we have at present. It is, however, interesting to note that negative painting is not a characteristic of Yucatecan pottery.

Another characteristic of Piedras Negras polychrome pottery, on the decorative side, is the frequency of a red background. Two-thirds of the polychrome sherds have a red background, one-third an orange background. Negative painting is associated almost entirely with the red polychrome group, only two orange polychrome sherds showing any trace of it. There is a certain correlation of shape with background color; lids (53), narrow-necked jars (3-5), heavy, flat-bottomed dishes (60) and bowls with sides that are almost straight (54) are confined to red polychrome; jars with wide necks (11),

shallow, flat-bottomed tripod dishes with flaring sides (61, 62), and broad, shallow dishes (35-37) with occasional central designs are confined to orange polychrome.

In the matter of shape, a distinctive feature at Piedras Negras is the appearance of bevelled shoulders on jars with narrow necks, in orange and black wares (6,7). Another is the appearance of polychrome lids for fine polychrome bowls (53). Orange, yellow, and mottled wares show a certain affinity in shape, which bears out the suggestion that they are fundamentally the same ware, differing only in their manner or degree of firing.

The predominance of calcite in the tempering material of Piedras Negras pottery is a characteristic feature of pottery from this site. A summary comparison with petrographic analyses of other Maya pottery suggests that pottery tempering does not vary so much from one site to another as it does from one area to another, in variations that are determined by the geological formation of the surrounding country. Piedras Negras lies in a region where calcite was evidently the most satisfactory material. It is distinct from the two adjacent regions: Jonuta, where finely graded quartz was used for tempering material; and the Highlands, from which almost all the pottery tested is tempered by quartz or quartz and feldspar.

On the negative side, the following items should be noted:- the apparent absence of effigy feet, of handles, of tetrapods, of spouted and shoe vessels; the almost complete lack of effigy vessels, modelled decoration, and ring feet, and the relative scarcity of incised and carved decoration, and of life forms in decoration.

The Historical Value of Pottery in the City: Stratigraphy

What can pottery tell us of history in the city? We shall take the city by sections to see what chronological evidence there is in building stratigraphy and association of potsherds with monuments.

West. In the West Group we have on K-5 three superimposed buildings of which the latest has been assigned a tentative date of 9.12.5.0.0. We find Orange 2 cache vessels under the column altar of each level, a fourth vessel half-way down the terrace in front, and fragments of an Orange 2a bowl under a stone in the fill below the third floor. There was little other pottery associated with this pyramid. Of nine sherds found in 1931 in and around the latest building, four are orange ware, three unslipped, and two incised Black 1 ware. In 1932, twenty-four fine polychrome sherds, one mottled, and one red sherd were found in the fill between the second and third floors; four polychrome, one fine brown, one orange, and five unslipped sherds under the third floor, and an Orange 2a plate under a slab in the fill assembled for the third floor. While the evidence is incomplete,[5] it suggests that

---

[5] That part of the 1931 sherds which is in Guatemala was not available for study.

by the time the last building was erected, polychrome was not as popular as it had been when the earlier structures were built. We can say that incised-and-punctate Black 1 was in use at about 9.12.5.0.0. and that Orange 2, and Orange 2a appear two K-5 building periods before that date. The use of Orange 2 cache vessels already described suggests their association with certain temples and rites rather than with any given period. This is borne out by their absence in other temples, such as R-3,and their use through several periods at Holmul.

The incised orange bowl found in J-12 (Pl. VI, 6) suggests that such ware was used at the end of the city's occupation. Under the floor of the J-6 throne room were a few sherds, one Polychrome C, one brown-on-white,one brown,and several of fine unslipped ware, and a dish with a mottled slip inside and double-bar orange decoration outside. We can say, then, that this type of decoration came into use here no later than 9.17.15.0.0, the date of the Throne.

The only contemporary pottery vessels found with Vault Burial 5 were an Orange 2 plate, the base of a Polychrome C bowl, and two small round lids with crooked handles and traces of blue paint. This burial may eventually be dated late in Cycle Nine by inscribed shell plates.

Taking possible stela caches, we have Orange 2 vessels from the cist of Stela 6 (9.12.15.0.0.),a spiked censer (Pl. VI, 18) against the base of Stela 9, (9.15.5.0.0.), and an Orange 2a bowl under Altar I, (10,0.0.0.0?). Stelae 8 and 40 have only unslipped household vessel sherdsin the fill around them.

East. In the East Group, we have in O-13 another building with a date. While an early building level has been uncovered, it as yet unexcavated, so that the nearest approach we have to a sequence at present is the fact that the middle and rear rooms of the upper level seem to have been built earlier than the front of the building. All the unslipped cache vessels (13,19,20) that were found on and under the floor of the building come from the rear room[5]. There was very little pottery in the front of the building, although Orange 2 bowls were found under the front stairway as well as in the rear room. From what data we have now the date of the last phase of the building is more apt to conform to the 9.16.10.0.0(?) date of Lintel 3 than to the 9.11.15.0.0 date of Lintel 2, since there is some reason for thinking the latter to have been reused. Presumably, then, the pottery was in use before this date.

South. In the South Group, the pottery found in the debris on the steps and around the base of R-3, and R-2, much of it whole vessels in fragments, is considered to belong near the end of the city's occupation. It consists of black (10), dark-on-light-orange (Pl. VI. 9, 10), dark-on-light red (Pl. VI, 11), and Black 2 (6, Pl. VI, 13) vessels and sherds; and sherds of polychrome, orange, Orange 1, Orange 3, yellow, mottled, red, Brown 2, and unslipped wares.

In the South Ball Court, we have in the playing-field four sets of cache vessels, two of Orange 2 ware, one composed of two Polychrome E bowls (Pl. VI, 1, 2), and one of one Polychrome D bowl and one carlessly done Polychrome C bowl with debased scroll design in red and black on an orange-yellow background. This pottery is different in character from that found in the debris

from the Ball Court structures R-11. The latter consists of the Brown 2 vessels (48) and a small spiked tripod dish (58); and sherds of polychrome, dark-on-light orange (including a possible spout or handle), Orange 1, Orange 3, mottled, red 1, brown, Black 2, and unslipped wares. It resembles the material from R-2 and R-3 . The presence of Orange 2 and Polychrome E cache vessels in the field and their absence in the buildings may perhaps show a difference in time level.

The pottery from R-3 and R-11 stands out from the rest of the Piedras Negras material. Only here do we find Orange 3, Brown 2, dark-on-light red; three sherds that recall Yucatecan slate ware; and dark-on-light orange and Black 2 vessels in the shape mentioned above. This material shows two tendencies:- on one hand, there is almost no polychrome, but fine workmanship shown in the carved and cut decoration of Orange 3; on the other hand, there is the crudity and carelessness of treatment shown in Black 2 and dark-on-light orange and red wares, and the unslipped dishes (45) and ladle censers (64) found on the floor inside R-3. The outside associations of both Orange 3 and dark-on-light orange support the tentative late date suggested by position.

Southeast. In the Southeast Group, excavation of a house-mound group, V-1, established four levels in which pottery was found. The few sherds we have from them[5] show polychrome ware in the second and fourth levels from the top, orange ware in the third, and mottled and unslipped wares in the first three.

The specialized polychrome groups C-1 and D-1 are almost entirely confined to this part of the city; the only sherds of D-1 found elsewhere are two from the lower layers of pottery test pit 29.

Turning to stratigraphy apart from architecture, we find that a trench dug in 1931 in the north half of the West Plaza showed definite soil stratification in seven brown, black, and white layers. While these contained pottery, the deposits were irregular, since entire vessels, in fragments, came out of a black earth layer at one place, (pit 7, 1932), while at another a meter away, the black layer was almost sterile, (1931), with a thick deposit of sherds lying on top of it; and a test at a third point (pit 8, 1932), showed the loss of a stratum, and an almost complete lack of sherds. However, both of the cuts first mentioned showed no polychrome in the lower levels, and the greatest quantity of sherds in the middle levels. One-third of them were mottled ware, much of it tripod dishes, with some tripod cylinder bowls with slab feet. The 1931 sherds show banded bowls at the bottom, basal flanges and feet in the bottom and middle levels, fluted bowls and disk indentations in the middle levels, and ring bases and incising in the upper levels[5]. The 1932 sherds from these pits were destroyed by fire before a detailed study could be made of them. It has been impossible as yet to correlate this trench stratification with building periods on the Acropolis above, and nothing else similar has been found.

A stratigraphical study of the ceramic material from Piedras Negras was made in 1932 by digging forty-two test-pits, each one metre square, to bedrock. These pits were so placed as to give as complete an idea as possible

of the stratification and deposits in all parts of the city, while testing any place that might hold a refuse heap (Pl. XI). No large heap has as yet been found, and one wonders whether the river may not have been used to a certain extent for dumping. Three small heaps were located, however, one at the ravine between the East and West Groups (Pits 19-21), another beside Pyramid K-5 (pit 2) and a third in a small ravine between Pyramids O-12 and R-11 (pits 29, 30). The first of these had a dense deposit of sherds alone, the other included other types of debris such as fragments of figurines, human and animal bones, and stone mortars. While the nature and quantity of the material deposited proves it to be refuse, the deposits are small in area and unstratified. While they can be excavated more completely than has yet been possible, they cannot serve as the basis of a stratigraphical study. Two pits were sunk in the sides of the West Plaza trench (pits 7,8), as already described, three others were dug by strata where these were apparent in the soil (pits 24, 34, 40), but the majority were dug in arbitrary levels of 40 centimetres.

With the exception of the pit dug in the transverse valley leading to the expedition camp, (pit 1, too far north to be shown in plate XI) there was nowhere more than 2 meters between bedrock and soil surface. This held true not only with the horizontal surfaces of artificially constructed plazas, but with the sloping surfaces formed by debris in ravines. The latter, probed for refuse heaps, yielded no stratification; the former, almost none. In the South Group Plaza, there was less than a meter of unstratified fill above bedrock; in the East Plaza a paved floor was found at a depth of 75 centimeters, with a red clay below it that appears again in a pit sunk in the depression between the East and the Southeast Groups. In the southern half of the West Group Plaza there was less than a meter unstratified fill above bedrock; in the northern half, there was the clearly stratified deposit of 2 meters in depth referred to above. Pits sunk in the sides of the large ravine behind R-5 showed that its sides, hitherto considered natural rock, had been terraced in some places down to the bottom of the gully.

A relatively small number of pits of the forty-two dug had the quantity of sherds or depth of deposit to justify any statistical conclusions. The seven which did are listed below:

Pit	No. of Levels	No. of Sherds
2	4	604 (107 rims)
19	4	72 (12 ")
21	4	224 (30 ")
27	4	113 (25 ")
28	3	313 (36 ")
29	5	1223 (182 ")
30	4	247 (51 ")

The fact that identical, unique rim forms and the rough-and-smooth decoration on the exterior of orange vessels occur only in level 2 of pits 2, 29, 30, (pit levels are numbered from the top one down) is taken as apparent proof of these levels being contemporary, and four levels are tentatively considered to cover the period of occupation of the city. For level 1, in studying rim form, material was also considered from pits 5 and 25; for level 2, from pits 38 and 41. Material from pit W-5, dug in 1931, in front of Pyramid K-5, in three levels, approximately 40-50 centimeters each, was

included where relevant.

Considering the evidence from these pits, counting by rim sherds, we find the stratigraphy to indicate that polychrome pottery is most plentiful in the earliest strata, where orange polychrome and negative-painted red polychrome wares are equally prevalent. It is impossible to work out from these pits any theories as to the development of the technique used in painted decoration on Piedras Negras pottery, since negative painting, mass painting, and the combination of the two represented by Polychrome B occur in the lowest levels. Pottery decoration, like figurine-making, seems to have been already well-developed by the people who settled Piedras Negras.

If these pits be considered as covering approximately the period of the city's occupation, we can say that polychrome ware is most prevalent at the beginning, orange ware in the next period; fine brown ware appears at the beginning, red not until orange had become more popular than polychrome; but on the whole, we have the same range of wares from the beginning to the end--polychrome, orange, yellow, mottled, red brown, black, and unslipped.

There is, however, a certain amount of variation in shape and in rim from one period to the next. Conclusions as to possible sequence have been reached by finding, where possible, the ratio of each type to the whole number of rims from each level, and are merely tentative. They mean, not that a shape or rim form appears in only one period, but that the period to which it is assigned is that of its greatest frequency.

The ring base is first found in the fourth level, or earliest period, tripod bowls and dishes not until the third. This bears out Blom's find at Yoxiha, Chiapas, (Blom, pp.227-33) where tripods were confined to an upper burial, ring bases to a lower. A tripod cylindrical jar with slab feet belongs to the third level (17). Flanges (36-37) begin also in this period, when disk indentations on the exterior bases of bowls (42), and bowls with fluted sides (52), are most prevalent. Indented fillets begin in this period, and the use of one in place of a basal flange is confined to it (Pl. V, 11).

In the second level, we have cylinder jars (15, 16), flanges with the flattened edge like a ring base (37), and the beginning of sharp angles to the shoulders of jars (6). Peculiar to this period is a method of finishing the unslipped exterior of orange vessels by smoothing a band 1 to 2 centimeters wide along the edge, and roughening the rest of the surface.

The first level, or last period, has no outstanding characteristics.

Taking variations in rim form, we find V-shaped rims for storage vessels (26) most prevalent in the fourth level, R-shaped ones (21), in the first. A rim with a slanting edge (28) is most prevalent in storage ware in the fourth level, but a thin variety, painted orange inside, belongs to the second (30). Lids occur in the second and third levels. Bowl rims, slightly incurved (53) are most frequent in the third level. A bowl or dish with a flaring concave side (62) is most frequent in the second level, a modified form of it (54) in the third; a rim where the everted rim makes a sharp angle with the side (58) is most common in the third level, a modification of it (39) in the first. A plate rim where the side curves slightly out below a slanting edge (41) is characteristic of the fourth level and dis-

appears by the second, when it is replaced by a straight-sided plate with similar edge (34).

Several features, such as the early plate rim referred to, and flanges, which are early in the main part of the city, are in the top level in the Southeast Group. This suggests that this section of the city was used early in the period of occupation.

The wares found, then, suggest a comparatively short occupation of the city--perhaps little more than the four hundred years of Cycle Nine celebrated on the monuments. There is nothing to indicate such length of occupation as is shown at Uaxactun or any marked shift of population. This agrees with the evidence of the figurine types from this site (See Part II).

There are suggestions of sequence in shape, but the fact, already referred to, that the shapes assigned to one period are never confined to it alone, keeps us from using the shape or rim form of an undated vessel as a definite criterion of its age. They may serve to give it a tentative position that can be checked by other criteria.

There is definite though limited significance to the pottery from stela caches, where pottery is associated with a date; from K-5, where a building sequence culminates in a tentative date; and from O-13, a building with a tentative date. While the dating associations of R-3 are early, the vessels recovered from there are, from their position, taken as representing the last phase of Piedras Negras pottery.

Pottery associated with dated monuments:

Orange 2	Stela 6	9.12.15.0.0
Spiked censer	Stela 9	9.15.5.0.0
Orange 2a	Altar 1	10.0.0.0.0(?)

Pottery associated with tentatively dated building levels:

Polychrome A, C, Miscellaneous orange Orange 2, 2a, Brown.	K-5-3	Two K-5 building periods before 9.12.5.0.0, tentative date for K-5-1, established from Stela 39.[6]
Miscellaneous orange Incised-and-punctate Black 1.	K-5-1	9.12.5.0.0, date of Stela 39.
Polychrome, Dark-on-light orange, Miscellaneous orange, Orange 2, Mottled, Brown, Unslipped cache vessels (13, 19, 20).	O-13	Part of an O-13 building period before 9.16.10.0.0(?) date of Lintel 3.

6 Mason J. Alden, unpublished Piedras Negras Preliminary Report on K-5.

Pottery considered late from position as final deposit in buildings:

Dark-on-light orange, red,	R-3, R-11
Orange 3: grater bowls	
Orange 3: carved bowls	
Brown 2	
Slate ?	
Incised orange	J-12

What data we have from building-period and dated-monument associations suggest that polychrome wares were early, and were supplanted toward the end of the city's occupation by incised and carved decoration and degenerate forms such as dark-on-light orange and red. As regards a decreasing use of polychrome from early to late times, such evidence as is afforded by this material agrees with the evidence from the test pits.

Relations to Pottery from Other Parts of the Maya Area.

Considering this phase of Piedras Negras pottery, we can say that the material stands alone at the present stage of Maya ceramic studies. This is due primarily to the scarcity of pottery from the Usumacinta drainage, which, judging from the Piedras Negras material, a few sherds from Yaxchilan, and others from Jonuta, seems to constitute a distinct ceramic area, with related but individual units. There are indications of contact with other areas, but none strong enough to warrant an attempt at definite correlation.

ARCHAIC. The pottery from Piedras Negras shows no specific connections with Maya material known as coming from definitely early or "Archaic" levels. Early pottery from the Peten-British Honduras region (Merwin and Vaillant, Pl. 18-20; Thompson, 1931, Pl. XL-XLII, XLIV) has certain characteristics, such as tetrapod supports for bowls and tapering cylindrical jars, bowls with flaring ring feet, and narrow-necked jars with spouts rising from the side, parallel to the neck. It does not have negative painting nor red polychrome ware. None of these shapes has appeared at Piedras Negras, where, so far as we know, negative painting and red polychrome were abundant from the beginning. Archaic pottery from Arevalo-Miraflores, and Salcajá, Guatemala (Lothrop, 1927, fig. 8; Gamio, 1926-7, pp. 210-11, 216-17, 72, 131) and Santa Elena and Cerro Zapote, Salvador (Lothrop, 1927, fig. 4-6) consists of tetrapod vessels, vessels with effigy details, and angular jars different in character from anything found at Piedras Negras. In Salvador, we find in these levels Usulutan ware, bearing parallel-line decoration in a fugitive black paint that disappears, leaving a true "lost-color" design, light against a dark background (Lothrop, 1933, fig. 30-34). These traits have not as yet occurred at Piedras Negras.

This evidence coincides with the lack of "Archiac" figurines at this site, and it seems safe to say that Piedras Negras was not settled until after what may be called the Maya Archaic period.

OLD EMPIRE. In considering the relation of Piedras Negras pottery to the Old Empire level, we can at the present time divide the latter into six ceramic groups: Middle Usumacinta; Peten and British Honduras; Atlantic Highland (Chamá and Quiché); Copan, Honduras, and Salvador, Pacific Highland (Lake Atitlan); and early Peninsular (Campeche and Yucatan).

As far as we can judge, the ceramic development at Piedras Negras was distinct from that of the Peten cities of Holmul and Uaxactun, and the associated British Honduras site of Tzimin Kax, where the pottery develops consistently from a beginning marked by early characteristics, and which apparently have no pottery figurines other than "Archaic" ones. There are however, definite traces of contact. The orange votive bowl with flaring sides (45; Pl. VI, 8) is common to all these sites (p.), and is probably relatively early; the straight-sided, flat-based bowl is frequent, and probably early at Piedras Negras and Uaxactun (Smith, fig. 3, 4, a, c-e; Ricketson, E. B., fig. 25, e-h; Pl. 8, a-d), although the one instance of it at Holmul occurs in period V (Merwin and Vaillant, Pl. 31, a); it also occurs at Nakum (Tozzer, fig. 84-85). The flanged bowl, with and without tripod support, found in Holmul I to IV in orange polychrome and black lacquer wares (Merwin and Vaillant, Pl. 18,b; 20, e; 21-25; 26, b, c) occurs at Piedras Negras in orange polychrome, orange, and mottled wares (35-38), and with greater variety in types of flange than is apparent at Holmul. Flanged bowls in some of these variations occur at Uaxactun (Ricketson, E. B., fig. 28, a-c; Pl. 8, i-j). A dish with nicked flange (38; Pl. V, 6) occurs at Piedras Negras, and in tripod form at Yalloch (PM), Uaxactun (Ricketson, E. B., fig. 28, c) and Tzimin Kax; at this laste site, Thompson assigns the type to the local phase of the Holmul V period (Pl. XLV, 1, 3). The tripod dish shape that appears at Holmul in period V (Merwin and Vaillant, Pl. 29, a) seems to be late also at Piedras Negras (Pl. VI, 10). The same shape, with the same orange bar exterior decoration as is found on it at Piedras Negras, comes from British Honduras (MAI). Orange polychrome jars with wide mouths (11) occur at Piedras Negras, at Uaxactun (Smith, fig. 6, b, c), and in British Honduras (Gann, 1918, fig, 63; Mason, fig. 2, 6, 7, 8b). A large bowl, red-orange inside, with incurved rim, painted red down to an indented fillet on the outside (22), occurs at Piedras Negras and in British Honduras (MAI). At Tzimin Kax there is a narrow-necked jar with sharply bent shoulder, associated with vessels of the local Holmul I phase (Thompson, 1931 Pl. XLIV), that recalls jars from Piedras Negras (6-7).

There are also resemblances in decorative elements used at Piedras Negras and in the Peten: the vertical orange bars which occur on dish exteriors at Piedras Negras are found around the rim of a pottery drum from Yalloch (PM); negative-painted rings, a characteristic of Piedras Negras Polychrome A, appear in white against a vertical strip of red, as a subordinate element in the decoration of a straight-sided polychrome bowl from Nakum (Tozzer, fig. 85); a Piedras Negras rim sherd with painted three-feather parrot wings (Pl,I, 10) recalls bowls from Holmul I (PM) and the Highlands.

The resemblances between the two areas do not seem to be the result of trade so much as of local expressions of common ideas. The straight-sided bowl is the same, but the decoration differs from one site to the next; the orange votive bowls vary in consistency of slip and composition of paste; negative-painted rings are the same, but the decorative use to which they are put is different. A suggestion of direct influence is shown by a bowl from Uaxactun apparently decorated in the Piedras Negras negative-painted style (Smith, fig. 4, e).

The resemblances between the Alta Vera Paz-Quiché region and Piedras Negras carry out this suggestion of certain common denominators of pottery throughout the central section of the Old Empire, since we find in this Atlantic Highland region, as well as in the Peten and Middle Usumacinta, the

orange votive bowl (p. 9), the straight-sided bowl (Termer, fig. 11), the flanged bowl (UM; Termer, fig. 3-7), and bowl with nicked flange (Termer, fig. 3), the orange polychrome wide-mouthed jar (Termer, fig. 9-10), and the three-feather parrot motif (UM). Carved Orange 3 ware, in what might be called the Usumacinta style, occurs only at Piedras Negras, Yaxchilan, and Kixpek in the Chamá district.

There is, as well, definite evidence of trade between these two areas, such as the Chamá polychrome found in a few sherds at Piedras Negras, and the grater bowl found at Kixpek, which seems to have been a trade piece carried there from Jonuta, probably by way of Piedras Negras. These grater bowls present an interesting problem. One Orange 3 grater bowl comes from Kixpek, one or two from Piedras Negras, and several from Jonuta, on the Usumacinta, half-way between Piedras Negras and the coast of the Gulf of Mexico. Two Piedras Negras Brown 2 bowls are similar to the grater bowls, except that a decorative design instead of utilitarian parallel lines is incised on the floor of the vessel. A single vessel, from Kixpek is, in shape and color, like the Piedras Negras Brown 2 bowls, but lacks the incised design.

Tripod bowls with incised designs on the floor of the bowl occur from South America to Mexico (Jijón y Caamaño, Pl. CXXVIII, 4; Lothrop, 1926 a, pp. 214, 216-17, 221-22; Boas, 18 plates) where they are most frequent on the Aztec level, although a fragment from Gualupita (Vaillant, 1934, p. 88) shows that such vessels were made by at least one Mexican "Archaic" people who may, however, not have been particularly early (Linné, p. 76; Vaillant, 1932, a, p. 489). The specimens from Central and South America, and an occasional Aztec one, have decorative designs; most of the Mexican ones have, like those from Jonuta, Piedras Negras, and Kixpek, parallel lines cut deep in the clay while it was wet, presumably utilitarian, and responsible for the term "pepper-grater bowl". Such a feature is unusual enough so that one would expect some link between bowls showing varying forms of it in the same general geographic area. If such were the case, one would expect the non-functional, decorative form to be a development from the functional form, and therefore later in time. This would imply, in the case under consideration, that the Nicaraguan and South American bowls were derived from the Mexican, and were therefore on a later time-level.

Be that as it may, a petrographic analysis implies, from the quality and quantity of the quartz tempering used, that the Kixpek grater bowl is a trade piece from Jonuta, and that the Piedras Negras ones are local copies of the Jonuta ware. Jonuta grater bowls are stylistically as well as geographically closer to Aztec grater bowls to the north than to Nandaime and Managua grater bowls, their nearest neighbors to the south. While the grater bowl sherds at Piedras Negras are presumably late there, they belong with pottery that is definitely that of the Maya Old Empire. If they are copies of a Jonuta ware, that must belong to the same early time level. It cannot be a derivation from Aztec grater bowls, which it resembles in color, general form, and function. A suggested line of development is that we have at Jonuta a Tabascan prototype of the Aztec grater bowl, or a contemporary of its Mexican prototype.

We cannot tell the time relationship of the Highlands to the lowland areas. The hill country has been considered peripheral temporally as well as geographically to the Old Empire. However, the distribution of Chamá polychrome, prevalent in that district, appearing sporadically in Old Empire sites, and the apparent trade with Jonuta by way of Piedras Negras, suggested by grater bowls, imply a fairly early flowering of culture on the Atlantic

slope of the cordillera.

Piedras Negras shares with Copan the following pottery traits: Copan I polychrome potsherds, negative-painted disk decoration, low relief- and champ-levé- carved decoration. The Copan I sherds at Piedras Negras may be considered as trade pieces, and there is evidence of influence from them on Piedras Negras local polychrome ware. Relief carving on pottery is apparently late at Piedras Negras; at Copan it is associated with anomalous Mound 36. There is no other evidence of contact between Piedras Negras and the southeastern part of the Maya area.

There is little evidence of connection between Piedras Negras and the Pacific Highland region as represented by the pottery from Lake Atitlan. Since nothing has been published on early Yucatecan and Campeche material it is impossible to compare it with that from Piedras Negras.

LATE MAYA. The negative-painted disks, referred to as occurring at Piedras Negras and Copan, appear on a sherd from Hochob in the Rio Bec region, in a form identical with that found at Piedras Negras. Hochob has been considered, because of its architecture, to belong to a transitional period between the Old Empire and the Late Maya period. This single potsherd suggests a ceramic connection between Hochob and the Old Empire.

Piedras Negras pottery is definitely different in character from that of the Late Maya occupation of Chichen Itza. What Yucatecan pottery is available in publications shows some polychrome and more carved decoration, both distinct in style from those found at Piedras Negras. The development, suggested in Piedras Negras pottery, of a decreasing use of polychrome supplemented by the introduction of relief carving on pottery seems to have its logical sequel in Yucatecan pottery.

As mentioned before, what deductions can be drawn from a comparison of qualitative petrographic analyses of a small number of sherds from the Maya area point to variations from one region to another, rather than from one site to another. This is not as discouraging as it seems at first. The plan on Plate X shows the distribution of the eighty-two sherds examined. It will be noted that Piedras Negras is the only site where pure calcite tempering appears, and the only place where, in mixed tempering material, calcite is predominant over quartz. Except for one sherd from Kixpek, in which calcite is predominant, all the other sherds in which calcite is present show an equal quantity or a predominating quantity of quartz. Therefore, although the substances used for pottery tempering are few in number, the relative proportions employed may turn out to be as significant as a greater diversity of materials. The fineness, regularity, and quantity of the quartz tempering at Jonuta, for instance, distinguish it from any of the other quartz tempering examined.

We know that Piedras Negras was a major city of the Maya Old Empire. Its pottery, representative of the ceramically distinct Middle Usumacinta region, clearly belongs to the same stock as the other groups of Maya Old Empire pottery. It shares certain traits with the Peten, British Honduras, and the Atlantic Highland region, that are not characteristic of Copan,

Salvador, nor the Pacific Highland region as now known. Piedras Negras was also in touch with Copan, the easternmost great Maya city that must have provided the link between the Maya country to the east of it, and the central great city area to its west. Stela H at Copan shows a man in a striking costume characteristic of Palenque, the only costume of the sort on Copan stelae (Butler, 1931). This may be another instance of contact between the Middle Usumacinta and Copan.

It is almost too obvious to mention that the position of Piedras Negras on the bank of the Usumacinta undoubtedly determined many of its contacts. It would be almost inevitable that it trade with the Alta Vera Paz region around the headwaters of the Usumacinta; it would be very likely that trade would follow along the Usumacinta, the Chixoy, and the Motagua, from Piedras Negras to Copan and Quirigua. Just as inevitable would be trade down the river, with Jonuta, and, one would think, with Mexico, although there is no trace of direct contact with any region outside the Maya area.

NOTE ON POTTERY FROM THE 1933 EXCAVATIONS.

It is not possible to include in this paper an account of the pottery from the 1933 excavations, which will be published in a later paper. The material was well-preserved with interesting developments along the lines already indicated. Some features are outstanding.

One is the identification of a white ware. While sherds had been found before this showing the remains of a white slip, they were always so badly weathered that it was impossible to tell whether they were originally white or polychrome, since much of the polychrome, painted over a basic white slip, weathered in the same way. Among the well-preserved sherds from 1933 were some that proved beyond question the existence of a white ware at Piedras Negras. In addition to the ordinary white ware, in which the interiors of vessels are sometimes painted black, there are two white sherds, one a dish, one a bowl, which have a broad red line painted around the rim, and one small narrow-necked white jar with a crude orange geometric design on the side.

Large single scrolls occur on the sides of Polychrome A bowls, and a vigorous conventionalized bird on a Polychrome D dish is done in a manner that recalls the Peten style (Smith, Pl. 2, 3). An animal effigy vessel foot was found in the West Group; present evidence suggests that this is a trade piece from the Chamá district.

Possible indication of contact with the Chukumuk district on Lake Atitlan in the Highlands of Guatemala is shown by two Piedras Negras gray-black sherds with incised-and-punctate and incised-and-hatched renderings of a stepped fret design (Lothrop, 1933, Fig. 16, c; 17, 27, a). A mottled ware Piedras Negras sherd has the same fragment of incised-and-cross-hatched design that is shown by Lothrop (1933, fig. 27 g) on a black ware Chukumuk sherd. There is also a red ware sherd from Piedras Negras grooved in the horizontal lines that occur at Chukumuk on orange, brown and red wares (Lothrop, 1933, fig. 12, h; 21, b; 27, e).

APPENDIX: QUALITATIVE PETROGRAPHIC ANALYSIS OF POTSHERDS.

by A. Williams Postel

The following tempering materials have been identified in the potsherds examined:- calcite, quartz and feldspar.

Calcite. Source: Crushed limestone. Calcite is identified by physical structure, by the usual optical tests, which show it to be distinct in physical structure from other types of calcium carbonate such as shell, and by its brisk effervescence when tested with cold dilute hydrochloric acid. This test provides definite means of distinguishing calcite from dolomite. A few typical dolomite rhombs were observed in some of the larger calcite aggregations, but they are comparatively rare; their presence would tend to bear out the opinion that the material was obtained by crushing limestone.

Quartz. Source: sand, probably from the river bed. Because of its extreme stability, quartz is the commonest of the detrital minerals, and as such forms the greatest part of the bulk of all sands. Many of the sherds subjected to petrographic analysis were tempered with both calcite and quartz. Quartz is often a minor constituent of limestones, being deposited contemporaneously with the calcium carbonate, or developing later as a secondary mineral. If tempering material is obtained by crushing such a limestone a certain amount of quartz would naturally be present. Of course the possibility of intentional mixture on the part of the potter must also be borne in mind.

Feldspar. Source: crushed igneous rock, or sand derived from such rock. The feldspar is associated with mica (biotite) and quartz in the sherds in which it is found. Such a mineral association plus the fact that a few of the feldspar show good crystal outline might be taken to support the tentative suggestion that the rock furnishing the tempering material was an acid porphyry.

The petrographic technique as used above is capable of refinement and a more quantitative application; this could be achieved by carrying out actual counts under the microscope on the relative proportions and sizes of tempering materials present, the counts then being converted into percentages. By these means two different types of pottery having the same kind of tempering could be statistically differentiated. One source of error might arise:- unless the people making the pottery had a well standardized procedure, the normal variation in proportion and size of tempering materials would be sufficient to invalidate the results obtained by precise analysis, this making it impossible to make any comparison on the similarity alone of the relative proportion of grade sizes and angularity of the tempering substance.

Many of the samples examined had spherical nodules of hematite sufficiently large enough to be seen by the naked eye (the diameters ranging approximately from 0.5 to 0.2 millimeters). The hematite was proven by blow piping, the nodules giving a strongly magnetic residue after being fused with sodium carbonate.

A preliminary investigation was also carried out to ascertain the possible heavy mineral content of these samples. To achieve this two of the specimens were crushed and passed through a 65-mesh sieve, and retained on a 200-mesh sieve; the separation was carried out with acetylene tetrabromide. The

samples so treated were L-16-645 and L-16-707.

The minerals obtained from L-16-645 were; magnetite and hematite in abundance; 4 zircons, and one grain each of hornblende and epidote were also noted. L-16-707 showed only magnetite and hematite.

The above results show a possibility of arranging a classification on the basis of heavy mineral content. The drawback to this method lies in the bulk of material that would have to be crushed to obtain a sufficient quantity of diagnostic heavy minerals.

Temperature of firing of ceramic material as ascertained from their mineralogical components is largely negative, that is, a maximum temperature may be determined above which the material could not have been fired, although the actual firing temperature may have occurred at any point through a long range below this maximum. The following information is listed in order to fix the temperature above which the pottery covered in this report could not have been fired.

Calcite dissociates at atmosphere pressure at a temperature of about 900° Centigrade.

Hematite melts at 1350-1400° Centigrade.

Magnetite melts at 1190-1225° Centigrade.

Quartz melts about 1780° Centigrade--strictly speaking this melting point should refer to silica; true quartz converts to tridymite at about 870° C., and tridymite converts to cristobalite at 1470° C. Cristobalite may melt at 1710° C.

Applying this information to the samples covered in this report, some idea may be obtained as to the firing temperatures to which they were subjected.

Polychrome A-1: L-39-21 (1). This sample is tempered with a medium well-graded angular to sub-angular calcite; cleavage was observed on some of the fragments. Quartz and hematite are rare. Color banding in cross-section is orange--black--orange.

Polychrome A-2: L-17-67. Tempering material is calcite, fairly evenly graded sub-angular fragments with a few large rounded grains. A few angular quartz grains were noted. Many small hematite nodules are present.

Polychrome B: L-39-89 (14). Tempering material is unevenly graded sub-angular calcite; some cleavage and a few granular aggregates were noted. Angular unevenly graded quartz is present (calcite forming the greater part of the tempering material). Both large and small hematite nodules were noted. Color banding: red--black--red.

Polychrome C: L-39-53 (2). Calcite is the chief tempering material in this sample; it is divided into small and large grade sizes, the fragments being angular to subangular; some cleavage and a few large granular aggregations were noted. Quartz is rare. A few good hematite nodules were observed. Color banding is present, the fragment in cross-section being divided into equal portions of yellow and orange.

Polychrome C-1: L-17-164. This sample is tempered with large spheroidal grains of calcite, the grains being composed of aggregates of finer particles. Medium sized angular quartz fragments are present. Calcite is present in larger quantities than the quartz. Small to very large hematite nodules were observed.

Polychrome D: L-39-73 (2). This pottery is tempered with calcite, the bulk of it being a medium-sized evenly graded subangular material though some large fragments are present. Quartz is very rare.

Polychrome D-1: L-17-203. The tempering material of this pottery is a fairly well-sorted angular to subangular medium-sized calcite. Quartz though present is rare. Some good hematite nodules were encountered.

Polychrome D-1: L-17-297. Unevenly graded subangular calcite; some cleavage noted. Quartz is rare. Hematite was observed in both large and small angular fragments and nodules. Color banding: Buff--grey--buff.

Polychrome E: L-27-85. This sample is tempered entirely with calcite, the fragments being angular to subangular and fairly well graded; no cleavage was observed. No quartz was noted, and hematite nodules are very rare.

Polychrome E: L-17-203. The tempering material of this pottery is a fairly well-sorted angular to subangular medium-sized calcite. Quartz though present is rare. Some good hematite nodules were noticed.

Polychrome E: L-17-178. Medium-sized unevenly graded subangular calcite tempers this pottery, some cleavage being noted in the calcite. Fairly frequent angular to subangular quartz was observed (calcite is present in by far the greater quantity). Large and small hematite nodules are present.

Dark-on-light Orange: L-39-27 (1). The tempering of this pottery is fairly diverse and is composed of a fair quantity of fine angular quartz, small angular and spherical calcite fragments, and few hematite nodules. Color banding is represented by equal portions, in cross-section, of light yellow and gray. This pottery is so similar to L-28-55 that in classification they can undoubtedly be put together.

Dark-on-light Orange: L-28-58. This pottery has a fine texture and is tempered with a fine evenly graded angular to subangular calcite. Quartz is present though rare. The section is bordered by a more highly granular than the interior. Fine angular fragments and nodules of hematite were noted.

Dark-on-light Orange: L-28-55. As in L-28-54a the tempering of this sample is composed of both calcite and quartz. The calcite is present in the greater proportions; the former mineral is present in unevenly graded angular fragments, some of which show good cleavage. The quartz is unevenly graded and ranges from angular to subangular fragments. Hematite patches were noted and good brown biotite, strongly pleachroic; some well bleached; also some vermiculite. This sample is gray in section save for a thin white coating.

Dark-on-light Red: L-28-72 (1). The tempering material in this sample is rounded to subangular, medium-sized,unevenly-graded calcite; some cleavage and large rounded calcite aggregates were observed. Unevenly graded angular quartz was noted (the calcite is present in larger quantities than the quartz). Abundant biotite or vermiculite fragments are present, and a few small hematite nodules. The structure is somewhat fibrous. Color banding: buff--orange.

Orange, Miscellaneous: L-28-10. The tempering material used in this pottery is chiefly calcite; it is of a well-sorted grade-size, though occasional large aggregate grains are encountered; some of the calcite exhibits good cleavage. A few angular quartz fragments are present, though these are rare.

Orange, Miscellaneous: L-16-673. This sample is tempered with angular to subangular calcite which is fairly well sorted as to grade-size; some of the calcite shows good cleavage. Quartz is extremely rare.

Orange 1: L-28-72. Calcite is the principal tempering agent in this sample, both large and small grade-sizes being observed. Some good cleavage was noted in the calcite.

Orange 2. This pottery is tempered with an unevenly graded, fine to large, angular to subangular calcite; some of the larger fragments show very good cleavage and twinning. Quartz is very rare.

Orange 2a: L-28-6. This material is tempered with a fairly well graded medium angular to subangular calcite, though a few isolated large particles observed. Quartz is present as unevenly graded angular fragments (calcite is present in larger quantities than the quartz). Hematite nodules were noted.

Orange 2a: L-39-X. Tempering material is a fine evenly graded calcite. Quartz is present though rare. Some small hematite nodules were noted.

Orange 3: L-28-58a. The tempering material of this sample is composed of fine evenly graded quartz. The fragments are mostly angular in shape. No calcite was observed though a slight acid reaction was noted in the matrix. There is a greater quantity of tempering material here than in the other sherds tested.

Orange 3: L-28-58b. The tempering of this sample is similar to the above sample in quantity and quality save that the grade size of the quartz is slightly larger. A few hematite patches were noted.

Yellow: L-16-468. The tempering material here is a well-sorted angular to subangular calcite, some of which exhibits cleavage. Quartz though present is exceedingly rare.

Mottled: L-39-73. Tempered with unevenly graded angular to subangular calcite; good cleavage was noted in the calcite; a few spheroidal grains were also observed. Quartz though present is rare. Hematite nodules are present.

Mottled: L-16-707. Calcite is the main tempering material encountered in this pottery. As in sample L-16-714 it can be divided into two definite grade-size groups, large and small. Quartz was noted but is very rare.

Mottled: L-16-626. This sample is tempered with fairly evenly sorted calcite and quartz. The calcite merges well into the matrix in such a way as to suggest a higher temperature of firing than that to which the other specimens were subjected. The quartz, though not as frequent as the calcite, is quite

numerous and is scattered through the matrix as irregular particles of finer grading than the calcite. No structure is observable in the calcite.

Mottled: L-16-714. The tempering of this sample is calcite, which is divided into two definite grade-size groups, large and small; both these groups show good sorting. The larger grade-size suggests dolomitic aggregates. Cleavage in the calcite is not common, but some was observed. Quartz is rare, but is commoner than in samples L-16-468 and L-16-673.

Red Miscellaneous: L-17-167. This pottery is tempered with a fine evenly graded subangular calcite and many large spheroidal aggregates of calcite. Frequent large to small, angular to subangular quartz grains were noted (the calcite is present in greater proportion than the quartz). Many small hematite nodules were observed.

Red Miscellaneous, Maroon, on orange paste: L-16-426. This pottery has a very fine texture; it is tempered with a very fine well-graded angular quartz. Silica needles and many small hematite nodules were noted. No calcite was observed. This type may be compared with the Orange 3 (L-28-58a) type--from size and abundance of tempering material.

Red 1: L-28-72. No calcite was observed in this pottery; the tempering material is an unevenly graded angular to subangular quartz. Hematite nodules were noted.

Brown, Miscellaneous: L-28-33. The tempering in this sample is an unevenly graded subangular calcite with very good cleavage. Quartz and hematite are very rare, though quartz is present in greater quantities than the hematite.

Brown 2: L-28-52b. This sample is tempered with large spheroidal grains of calcite, and unevenly graded angular quartz. Traces of organic material were noted. Clear patches of an isotropic substance (vitrified material?) are occasionally encountered. Small hematite nodules are present. Structure had a matted appearance. Color banding: Black--gray--thin black.

Brown 2: L-28-54b. This pottery is tempered with a fairly well sorted fine angular calcite. Quartz though present is exceedingly rare. Some good hematite nodules were noted. Color banding in cross-section was noted, namely: thin black--orange--thin black.

Black: S-2-23. This sample is tempered with an unevenly graded angular to subangular calcite; some of the fragments show good cleavage. Several large spheroidal grains of calcite showing concentric ring structure were observed. Fine angular quartz is present. Biotite was noted; large hematite nodules were also seen. In view of the above the designation Black would seem very doubtful; this specimen seems more closely allied to the Dark-on-light Orange type (samples L-28-55 and L-39-27 (1)).

Black 1: L-28-24. The tempering material of this specimen is composed of poorly graded quartz, the fragments ranging from small flecks to large particles. No calcite was observed.

Black 1: L-16-209. An unevenly graded angular to subangular quartz forms the main tempering material of this sample, though a few fragments of calcite were noted and a slight acid reaction was observed in the matrix.

Black 1: L-39-50. Fine and medium quartz particles made up the tempering of this sample, the fine grade size being in the majority. The fragments range from angular to subangular. No calcite was observed.

Black 2: L-28-54a. The bulk of the tempering material in this sample is an unevenly graded angular calcite; a few of the fragments show fair cleavage. Frequent fine well-graded quartz in angular form were also noted in the tempering. A few well-formed hematite nodules are present. This pottery in cross-section has a definite color banding, namely: orange--black--orange.

Black 2: L-28-72 (2). Tempered with large evenly-graded angular to subangular calcite; some cleavage was seen; fine angular quartz was observed to be disseminated through the matrix of the pottery. Many fine hematite nodules are present.

Unslipped: L-16-645. This pottery is tempered with calcite, the fragments being angular to subangular and evenly graded. Practically no cleavage structure was seen. Quartz was encountered, but is quite rare.

JONUTA

Jonuta, Orange: 31-25-30. This pottery is a very fine grained distinctive type and has not been encountered heretofore. It is tempered with very fine evenly graded quartz, the fragments being mostly angular. Color banding in cross-section is dark red--light red--dark red.

Jonuta, Orange: 31-25-5a. This pottery has a very fine texture, and is tempered with a very fine fairly well graded angular quartz. Many small hematite nodules were observed.

Jonuta, Gray: 31-25-14. This pottery has a very fine texture; it is tempered with a very fine evenly graded angular quartz and a few fine silica needles. No calcite was observed.

Jonuta, Black: 31-25-X. This sample is tempered with an unevely graded angular to subangular quartz; a few silica needles were observed. A few calcite grains were noted, but quartz is far more abundant than calcite. Hematite nodules are present. Color banding: Brown--black--brown.

Jonuta, Black: 31-25-16. This type is tempered with roughly equal portions of fairly well graded fine angular quartz and calcite. Silica needles were noticed. Color banding in cross-section was shown by a very thin outside band of light gray.

Jonuta, Unslipped. A fairly well graded medium angular quartz tempers this sample. Some hematite nodules were noted.

HIGHLANDS OF GUATEMALA

Chamá: NA 11302. An unevenly graded angular to subangular quartz constitutes the tempering material of this sample. Many silica needles and a few plates of mica were noted.

Chamá, Red: NA 11239. Angular to subangular quartz is the main tempering material of this sample. Many silica needles were noted. Mica though present is rare. Some hematite nodules were observed.

Chamá: NA 11121. This sample is tempered with a fairly evenly graded fine subangular quartz. Abundant plates of mica (biotite) and silica needles were also noted. Some small hematite nodules were also observed.

Chamá: NA 11124. A fairly graded, medium, angular to subangular quartz is the main tempering material of this pottery. Abundant silica needles and biotite were also noted.

Chamá: NA 11103. This sample is tempered with a fairly well graded fine subangular quartz. Some silica needles, hematite nodules, and biotite were also observed.

Chipal, Red-on-buff effigy: NA 11377. The tempering material of this pottery is an unevenly graded angular to subangular quartz. A few hematite nodules are present. Biotite though present is rare.

Chipal: NA 11563. Ths sample is tempered with an unevenly graded angular to subangular quartz. A few hematite patches were observed.

Kixpek, White-and-black: NA 11597. The tempering material of this pottery is an unevenly graded mixture of feldspar and quartz; one perfect crystal of orthoclase showing Carlsbad twinning was observed. Rare biotite or vermiculite is noted.

Kixpek, Black: NA 11603. The chief tempering material of this sample is an evenly graded angular to subangular quartz. Some hematite patches were also noted, and a little biotite and vermiculite are present.

Kixpek, Plumbate: NA 11603. This sample is tempered with a fairly evenly graded angular quartz.

Kixpek, Orange 3 grater bowl: NA 11622. This pottery has a very fine texture, and is tempered with a very fine fairly well graded angular quartz and many silica needles. Some small hematite nodules were observed. This pottery is similar to Jonuta Orange (31-25-5a and 31-25-30).

Kixpek, Orange 3 carved bowl: NA 11606. This pottery has a very fine texture; it is tempered with a fine angular quartz. Some small hematite nodules were noted.

Kixpek, Black: NA 11599. The tempering material of this pottery is an unevenly graded angular to subangular quartz. Some hematite nodules were present. A few rare silica needles and plates of biotite were also noted.

Kixpek: NA 11633. This pottery is tempered with an unevenly graded angular to subangular quartz. A few silica needles were observed. Color banding: brown--black--brown.

Kixpek, Buff: NA 11634. The tempering material of this sample is an unevenly graded subangular quartz. Biotite though rare was noted. Color banding: brown--black--brown.

Chuitinamit, Polychrome: 33-24-10. The tempering material of this sample is composed of an unevenly graded angular quartz. Some feldspar was also noted, though it is fairly rare. Hematite nodules are present. No calcite was encountered. Color banding: red--black--red.

Chuitinamit, Red-on-buff: 33-24-12. Quartz forms the tempering of this sample, the particles being angular and unevenly graded. No calcite was observed; a few magnetite nodules were noted. Color banding in cross-section was brick red--dark gray--brick red.

Chuitinamit, White-on-red: 33-24-7. Same as 33-23-10, only some of the quartz shows undulose extinction, and the feldspar is perhaps a little rarer.

OTHER MAYA SITES

Baking Pot, Red-Orange: T-6[7]. This sample is tempered by an unevenly graded fine angular quartz and calcite, some of the calcite showing good cleavage. Quartz and calcite are present in about equal proportions. A few hematite patches were noted.

Labná, Buff: T-16 [7]. The tempering material of this pottery is an unevenly graded angular to subangular quartz. Hematite is abundant and some calcite is present. An unidentifiable yellow mineral, showing no extinction, is to be recorded.

Labná, Slate: T-13 [7]. This sample is similar to T-16 but a slightly larger volume of calcite was observed, some of the fragments being fairly large and showing good cleavage.

Holmul, Red-Orange: C-5707-(1)[7]. The tempering material in this sample is an unevenly graded subangular calcite; a few large aggregate and spheroidal particles were observed. Quartz is very rare.

Holmul, Red Wash: C-5707-(2)[7]. This pottery is tempered with an unevenly graded subangular calcite and a fairly well graded angular quartz. Quartz is present in greater quantity than the calcite; some good cleavage was noted in the calcite. Some feldspar and mica (biotite) were also noted.

Nakum, Red-Orange: C-5131-(1)[7]. Fine fairly well graded angular quartz is the main tempering agent in this sample. A few spheroidal calcite particles were noted. Some biotite was observed. Hematite nodules are present.

Nakum, Red-orange-on-white: C-5122[7]. This pottery has a smooth fine texture and is tempered with a medium unevenly graded angular quartz. Both large and small hematite nodules were noted.

Copan, Orange Polychrome: C-980-(3)[7]. An unevenly graded angular quartz is the main tempering agent in this pottery, though some feldspar and mica were noted. Some hematite nodules were observed.

Copan, Polychrome (Copan 1; cf. Piedras Negras, Polychrome E): C-980-(2)[7]. This sample is tempered with an unevenly graded quartz. Hematite though present is rare.

Quirigua, Polychrome: C-8564[7]. Unevenly graded angular to subangular quartz forms the tempering material in this pottery. A few rare biotite wisps were noted.

Ulua Valley, Polychrome: NA 5535. This pottery is tempered with a fairly evenly graded angular quartz. Calcite though present is rare. Numerous hematite nodules were observed.

CENTRAL AMERICAN AND MEXICAN SITES

Rivas, Nicaragua: 21907. The tempering material of this sample is composed of an unevenly graded feldspar and quartz; a little mica was noted.

Panama, Chiriqui, Black Incised: 29-52-954. Tempering composed of unevenly graded quartz and feldspar. The feldspar often shows good crystal outline; some Carlsbad twinning was also observed. Some of the quartz exhibits undulose extinction. Occasional plates of biotite were noted.

---

7 Courtesy of Peabody Museum, Cambridge.

Panama, Chiriqui, Negative-painted: 29-53-1256. The main tempering material of this sample is an unevenly graded angular to subangular quartz. The following minerals though rare were noted; rutile, biotite, pyroxene (hypersthene?), feldspar and hematite.

Panama, Chiriqui, Armadillo: 29-52-778. An unevenly graded angular quartz and feldspar composes the main tempering material of this sample. A few hematite nodules and a little biotite were also noted.

Mexico Valley: S. J. T. 394. This sample is tempered with an unevenly graded quartz and feldspar, the latter often showing good crystal outline and twinning. A few rare mica flakes were observed.

Mexico Valley: S. J. T. 447. This pottery shows, with the exception of some very rare mica, the same tempering materials as S. J. T. 394. Color banding is as follows:- brown--black--brown.

PLATE I

Polychrome sherds showing geometric designs:

1. Polychrome A-1, L-28-35
2. Polychrome A-1, L-17-221
3. Inner surface of a Polychrome A-1 sherd, showing glyph band, L-17-62
4. Polychrome D, L-28-9
5. Polychrome C, L-16-116
6. Polychrome A-1, L-16-893
7. Polychrome A-2, L-16-954
8. Polychrome B, L-28-10

Polychrome sherds showing naturalistic designs:

9. Polychrome C, human hand, L-28-11
10. Polychrome D, parrot wing, L-28-51a
11. Polychrome C, human, L-17-76
12. Polychrome C, snake(?), L-16-324
13. Polychrome C, parrot wing, L-16-815
14. Polychrome B, human head, L-28-106
15. Polychrome B, snake(?), L-16-294
16. Polychrome D-1, L-17-297
17. Polychrome D, snake, L-16-290
18. Polychrome B, snake, L-16-275

PLATE I

PLATE II

Polychrome sherds showing geometric designs:-

1. Polychrome C, Year-Bearer symbol, L-17-125
2. Polychrome C, Year-Bearer symbol, L-17-73
3. Polychrome C, checker-board, L-28-26
4. Red-on-buff, L-16-323
5. Red-on-orange, dot-and-diamond, L-28-72
6. Polychrome C, L-28-10
7. Red-on-orange, braid, L-28-10
8. Polychrome E, braid, L-28-85
9. Polychrome C, L-28-76
10. Polychrome C, pyramid, L-28-106
11. Polychrome C, stepped pyramid, L-16-28
12. Polychrome C, stepped fret, L-16-404
13. Polychrome D, stepped fret, L-17-126

PLATE II

PLATE III

Polychrome sherds showing geometric designs: 1-4, variations of scroll; 5-14, glyph forms:-

1. Polychrome E, L-16-456
2. Polychrome C, L-16-401
3. Polychrome C, L-28-2
4. Polychrome D, L-28-78
5. Polychrome C, L-28-10
6. Polychrome D, L-17-149
7. Polychrome D, L-16-441
8. Polychrome C, 1-17-295
9. Polychrome C-1, L-17-32
10. Polychrome D, L-28-94
11. Polychrome B, L-17-21
12. Polychrome E, L-27-85
13. Polychrome E, L-27-85
14. Polychrome E, L-17-203

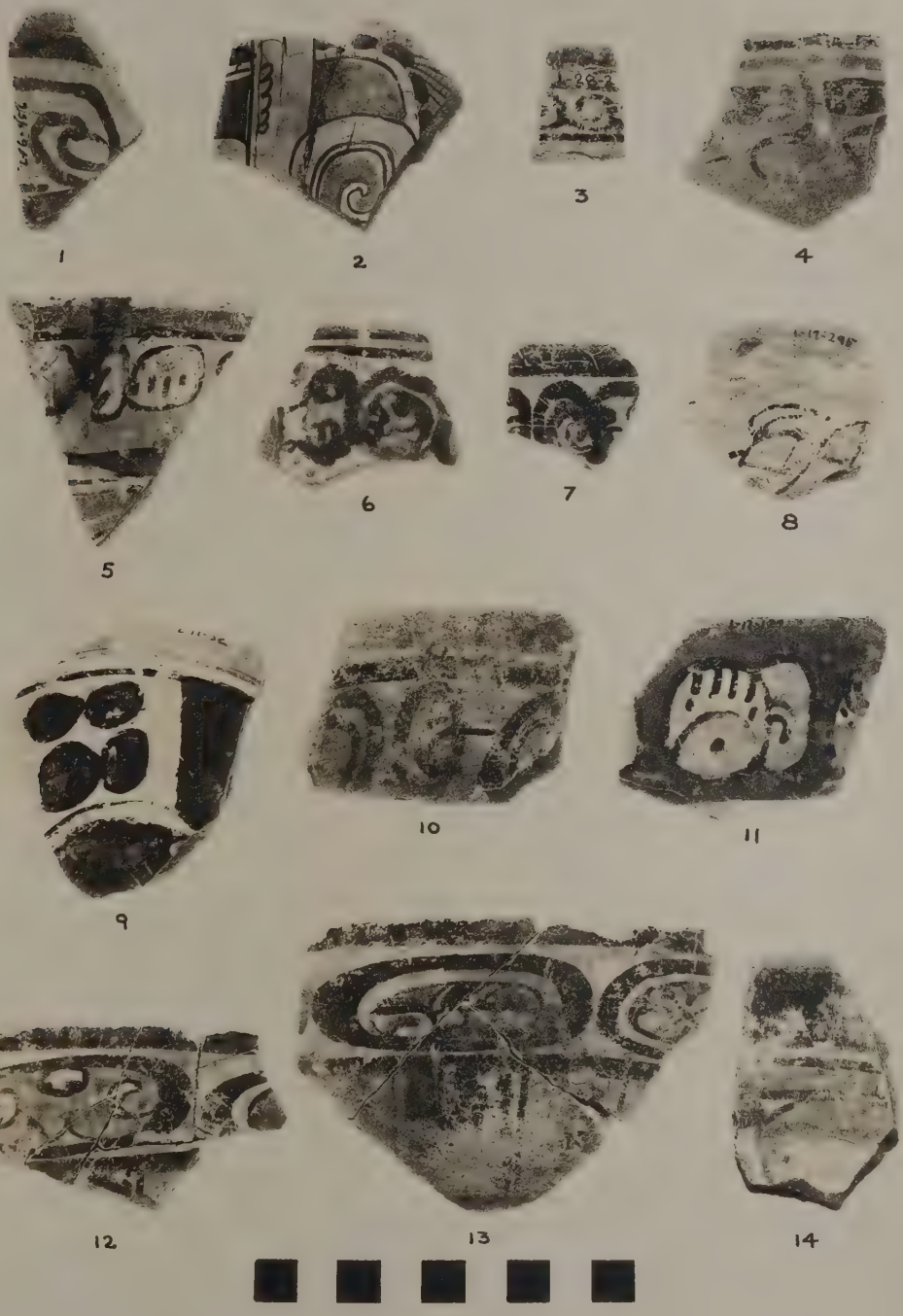


PLATE III

PLATE IV

Sherds showing incised, carved, and modelled decoration:-

1.	Incised, white ware,	L-17-79
2.	Champ-levé, mottled ware,	L-16-440
3.	Champ-levé, orange 3 ware,	L-28-70
4.	Carved, orange 3 ware,	L-28-73
5.	Incised, buff,	L-17-77
6.	Modelled and incised, mottled ware,	L-28-50
7.	Punctate, unslipped ware,	L-28-70
8.	Champ-levé, orange 3 ware,	L-28-70
9.	Modelled, polychrome ware,	L-28-76
10.	Applied head, unslipped ware,	L-28-163
11.	Incised, orange ware,	L-17-286
12.	Incised, orange ware,	L-17-354a
13.	Incised, orange ware,	L-17-78

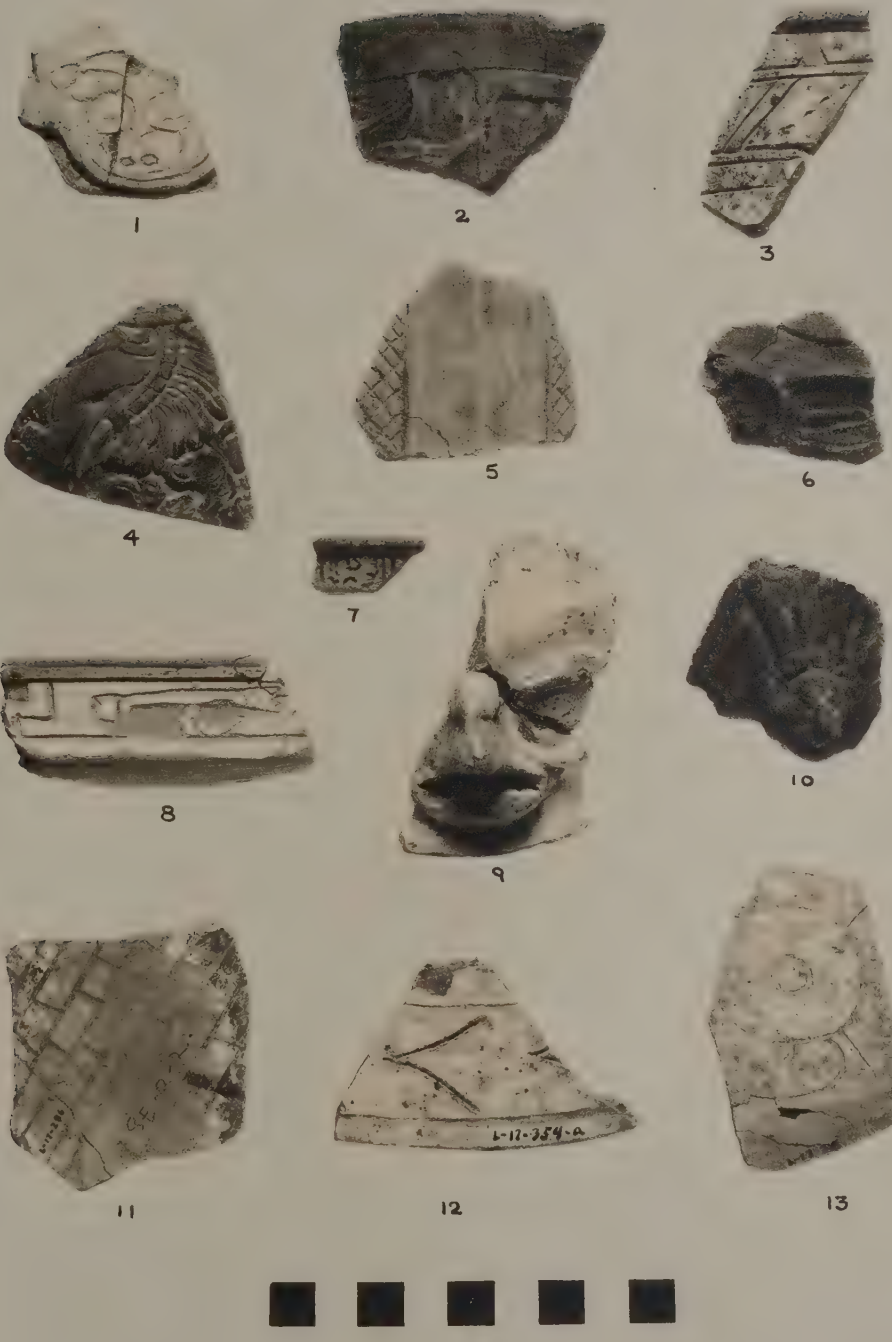


PLATE IV

PLATE V

Sherds and miniature vessels:-

1. Post-fired polychrome sherd, L-28-107
2. Possible handle, unslipped ware, L-28-161
3. Black-ware rim sherd, cut in stepped design, L-28-78
4. Miniature vessel, unslipped ware, L-28-159
5. "Scent bottle", mottled ware, L-17-116
6. Sherd with nicked flange, polychrome(?) ware, L-17-387,f
7. Sherd showing textile imprint, orange 2 ware, L-27-82

Sherds, illustrating ways in which indented fillet is used for decoration: 1, 2, 5, as medial flanges; 3, 4, as basal flanges; 6, as labial flange:-

8. L-28-106 (31)
9. L-28-81 (22)
10. L-17-83
11. L-28-106
12. L-28-58
13. L-17-375 (32)

PLATE V

PLATE VI

Vessels:

1. Polychrome E bowl, L-27-85
2. Polychrome E bowl, L-27-85
3. Dark-on-light orange cylinder jar, L-16-261
4. Polychrome C cylinder jar, L-16-44
5. White polychrome bowl, L-16-191
6. Orange bowl, with incised parallel lines, L-28-1
7. Orange 2 bowl and lid, L-27-1a
8. Orange 2 bowl, with second bowl used as lid, L-16-334
9. Dark-on-light orange jar, L-27-121
10. Dark-on-light orange tripod dish, L-28-67
11. Dark-on-light red bowl, L-28-64
12. Black jar, L-16-224
13. Black 2 tripod dish, L-28-68
14. Brown cylinder jar, L-16-124
15. Brown 2 tripod bowl, L-28-170
16. Brown 2 tripod bowl, L-28-57
17. Lacandon censer, L-16-818
18. Spiked censer and lid, L-16-857
19. Nail-marked unslipped jar, L-28-3
20. Unslipped cache vessel, L-16-155
21. Unslipped cache vessel, L-16-104
22. Unslipped cache vessel, with lid, L-16-93, 95

PLATE VII

PLATE VII

Vessel shapes, actual and reconstructed, with table showing relation of shapes to wares:-

1 - 5. Narrow-necked jars

6 - 7. Narrow-necked jars with bevelled shoulders

8. Miniature narrow-necked jar, "perfume bottle"

9. Narrow-necked jar

10-12. Wide-necked jars

13-14. Pear-shaped jars

15-17. Cylinder jars

18-20. Jars with flaring lips

P= polychrome wares

O= orange wares

Y= yellow ware

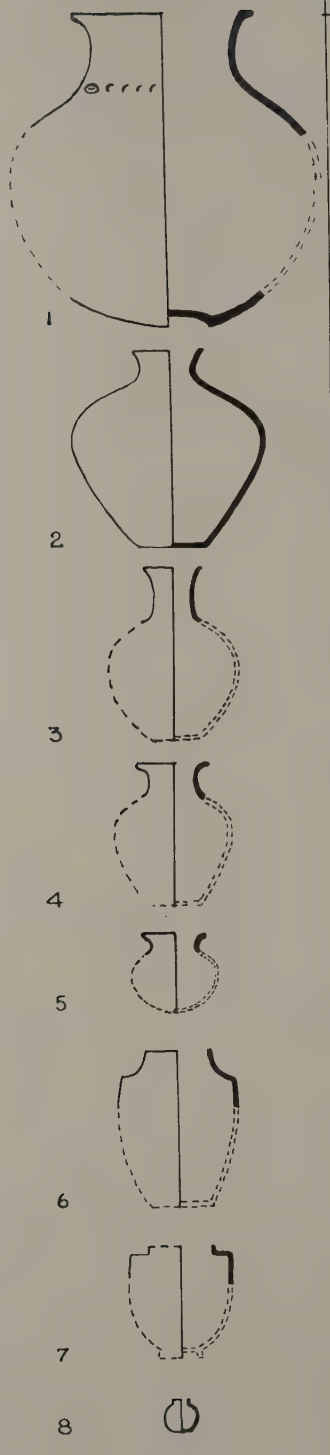
R= red wares

B= brown wares

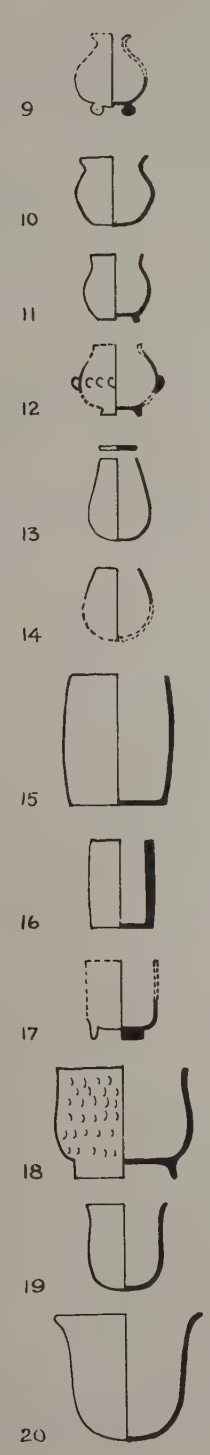
Bk= black wares

M= mottled ware

U= unslipped ware



	P	O	Y	R	B	Bk	M	U
1								X
2	X							
3	X	X						
4	X	X	X					
5	X	X						
6						X	X	
7		X						
8							X	



	P	O	Y	R	B	Bk	M	U
9		X						
10						X	X	X
11	X				X	X		
12						X		
13								X
14	X	X						
15				X	X			
16	X							
17							X	
18								X
19								X
20								X

PLATE VII

PLATE VIII

Vessel shapes, actual and reconstructed, with table showing relation of shapes to wares:-

21-22. Bowls with constricted mouths

23-28. Bowls

29. Bowl with ring base

30. Bowl

31-32. Bowls with encircling indented fillets

33. Bowl with bevelled side

34. Plate with ring base

35-38. Flanged dishes

39. Dish

40. Tripod plate

41. Plate

42. Bowl, with disk indentation in base exterior

P= polychrome wares

O= orange wares

Y= yellow ware

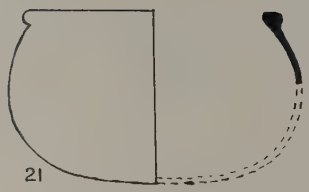
R= red wares

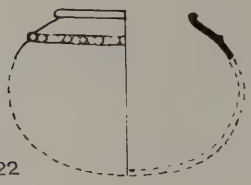
B= brown wares

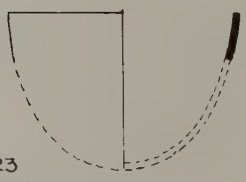
Bk= black wares

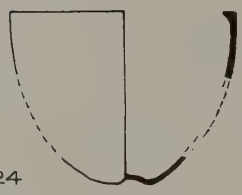
M= Mottled ware

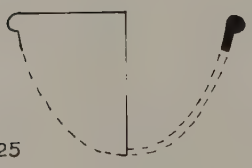
U= unslipped ware

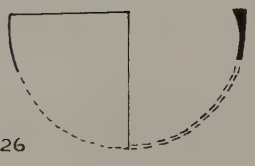


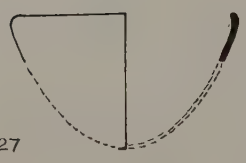












P	O	Y	R	B	Bk	M	U
	X		X				X
							X
							X
							X
							X
							X
							X

P	O	Y	R	B	Bk	M	U
	X						X
	X						
	X						
	X			X			
							X
X							
X	X		X				
X	X			X			
X	X					X	
X	X						
X							
X	X		X				
			X	X			
X	X						
X					X		

PLATE IX

Vessel shapes, actual, and reconstructed, with table showing relation of shapes to wares:-

43-44. Bowls

45. Bowl with flaring straight sides

46. Tripod bowl

47. Bowl with bevelled side, and constricted mouth

48. Tripod bowl with bevelled side and constricted mouth

49. Bowl with bevelled side, convex above bevel

50. Gadrooned bowl

51. Bowl with banded rim and disk indentation in base exterior

52. Fluted bowl

53. Bowl. Lid with inner rim

54-56. Straight-sided bowls

57. Spiked censer with ring foot

58. Tripod spiked bowl

59. Tripod straight-sided bowl with basal flange

60. Tripod straight-sided bowl

61-63. Tripod dishes with flaring sides

64. Ladle censer

65. Lid

66. Tripod bowl with basal flange and flaring sides

67-75. Rattle feet

76-82. Solid feet

P= polychrome wares

O= orange wares

Y= yellow ware

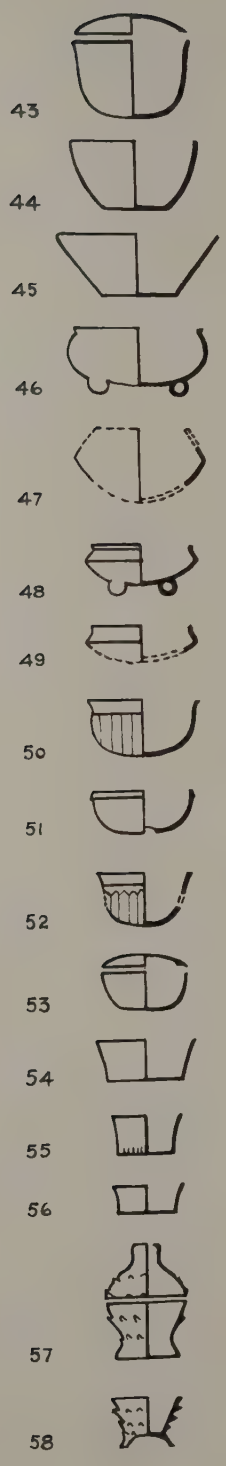
R= red wares

B= brown wares

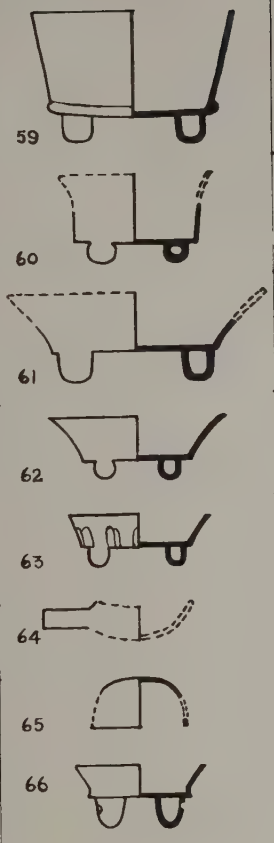
Bk= black wares

M= mottled ware

U= unslipped ware



	P	⊙	Y	R	B	Bk	M	U
43		X						
44		X						
45		X						X
46		X						
47							X	
48					X			
49		X						
50		X						
51		X						
52		X	X				X	
53	X			X		X		
	X	X	X	X	X			
54	X	X		X				X
55		X						
56							X	
57								X
58								X



	P	⊙	Y	R	B	Bk	M	U
59		X					X	
60	X							
61	X							
62	X							
63	X							
64								X
65		X						
66		X				X		

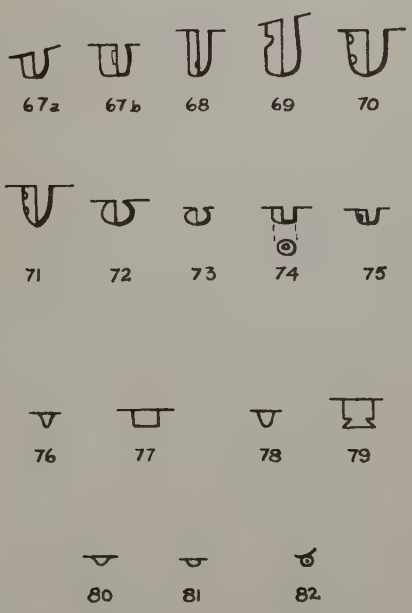


PLATE IX

PLATE X

Map of the Maya area, showing distribution of tempering materials, and the number of sherds tested from each site.

c----calcite

q----quartz

f----feldspar

>----greater than

= ---equal to

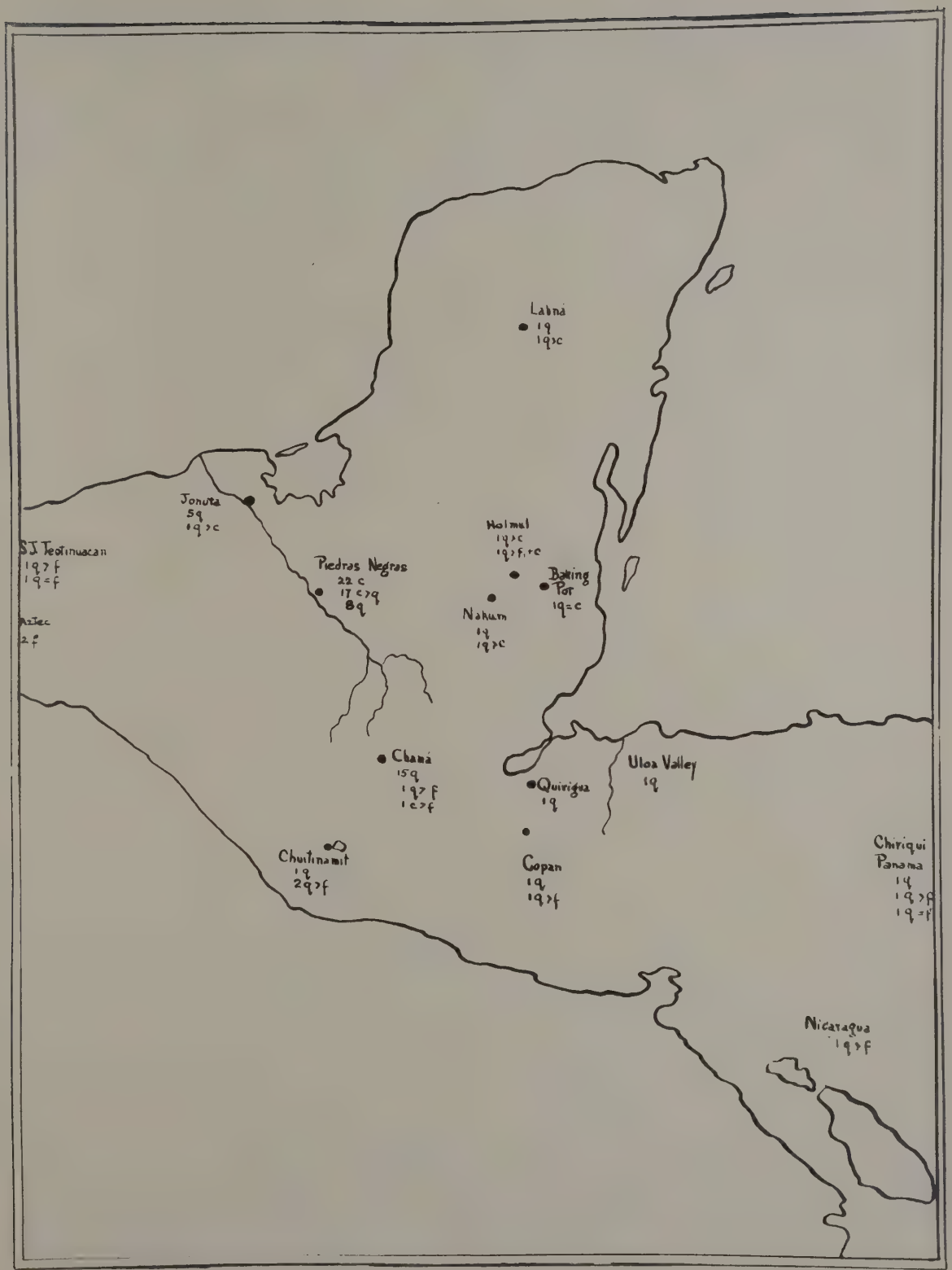

Labná
1q
1q>c
Jonuta
5q
1q>c
SJ Teotinuacan
1q>f
1q=f
Aztec
2f
Piedras Negras
22 c
17 c>q
8q
Holmul
1q>c
1q>f,+c
Baking Pot
1q=c
Nakum
1q
1q>c
Chamá
15q
1q>f
1c>f
Quirigua
1q
Ulua Valley
1q
Chutinamit
1q
2q>f
Copan
1q
1q>f
Chiriqui Panama
1q
1q>f
1q=f
Nicaragua
1q>f

PLATE X

PLATE XI

Part of the plan of the city of Piedras Negras, showing locations of pottery test-pits.

A B C D
E F G H
J K L
M N O P
Q R S
T U V
— SEQUENCE OF 200 METER SQUARES —
WEST
GROUP
PLAZA
EAST
GROUP
PLAZA
MOUNDS
MOUNDS
MOUNDS
MOUNDS
SOUTH
GROUP
PLATE XI

FIGURINES, ORNAMENTS, AND MISCELLANEOUS OBJECTS

INTRODUCTION

The excavations of 1931-2 at Piedras Negras uncovered ninety-five human figurines made of baked clay. All but three of these conform to mould-made technique. Eighty-nine belong to a realistic finely executed style designated as X (Butler, 1935); three to a style that can at present be called a local phase of Style Y, conventionalized, crude, and vigorous. One of the remaining three figurines has a crudely modelled body below a head that was probably mould-made. Of the other two, modelled, heads, one is very badly weathered, and the other is grotesque, archaistic rather than archaic. There is no indication of figurines that can be considered as "Archaic".

Piedras Negras figurines occur sporadically as deep as a meter from the surface in deposits whose depth, to bed-rock, seldom exceeds 1.60 to 2.00 meters. The only evidence of human presence at the site later than the Old Empire is in a few Lacandon incense-burners. There is no reason to believe the Lacandones capable of producing work as fine as these figurines. It seems safe then, stratigraphically as well as stylistically, to assign them to the main occupation of the city, during the best years of the Maya Old Empire.

The Piedras Negras figurines come from all parts of the city, being found usually in dump-heaps or the debris around buildings. In the latter case, traces of stucco on several suggest that, like potsherds, they are used in the armature for decorative stucco relief. This implies that most of them are discards, and would account for their fragmentary condition. Of seventy-nine human heads, only five have bodies attached to them. Headless torsos number sixteen. Many figurines have the form of whistles, due to vents in the hollow body and a mouthpiece, attached usually at the lower back of the figure. While this may mean merely that whistles were made in the form of clay figurines, there is the possibility that the idea of using a clay figurine as a whistle developed incidentally from the technique of making figurines in a mould, which required a hollow body with vents in it for any figure reproduced in the round. There are specialized figurine forms in the Ulua Valley, the Highlands, and Yucatan, where the function has conditioned the shape of the piece, but nothing of this sort has as yet been found at Piedras Negras. A few Piedras Negras figurines are pierced from side to side through head or shoulder, probably for suspension as an offering or amulet, or for carrying around the neck in the case of whistles. Clay figurines do not occur in burials or votive caches, although in caches tiny jade and shell figurines are frequent enough.

In describing the Piedras Negras figurines, we shall take first the human effigies, then the animal. There is technical variation in those figurines which show more than the head. Some have head and body cast in one mould; others have head and body moulded separately and then joined; some have modelled bodies; all, with one exception, are finely done. Bodies, with the one exception just mentioned, are hollow; heads may be hollow or solid. The clay is fine, tempered with calcite and quartz. It is seldom fired high, and the colors range from brown, through orange to buff, the most frequent shade being a light red-orange; the heads are small, the face

averaging 2-3 cms. in height.

References to specimens in other collections are indicated by the symbols:-

PM, Peabody Museum of American Archaeology and Ethnology, Harvard University, Cambridge, Mass.

AM, American Museum of Natural History, New York, N. Y.

FM, Field Museum of Natural History, Chicago, Ill.

UM, University Museum, University of Pennsylvania, Philadelphia, Pa.

JC, Private collection of Mrs. William James of Merida, now scattered.

MAI, Museum of the American Indian, Heye Foundation, New York, N. Y.

FIGURINES

Human Figurines, Mould-made

STYLE X

The bodyless state of most of the specimens in Style X makes it difficult to classify them. Falling back on a grouping by head-form, we find that the bulk of the material comes under Forms A, B, or C.

Headform A. Oval face, narrowing from jaw to flattened forehead, which slopes back from eyebrows at a sharp angle. Receding chin.

One type is established at Piedras Negras of which variants are found as far south as Costa Rica and as far north as Chihuahua. This the hunchback (F1-3)[8]. He appears at Piedras Negras as a seated man, nude except for a loincloth and neck ornament, (Pl. XII, 15); his left hand rests at his waist, his right hand by his side. Another Maya example, differing in treatment, comes from Jonuta (PM).

Seventeen heads, (F4-20), or almost one quarter of the total number so far found, have a high headdress, ending squarely at the top, that is cut straight across the forehead and falls away in steps, usually two on each side, to hang behind large round earplugs (Pl. XII, 1, 2). It is bisected in front by an incised vertical line; in back it comes down in one fold to cover the neck.

This stepped type of headdress occurs, with any number of additions and variations, throughout the Old Empire, but the plain, unadorned variety so far appears on figurines only at Piedras Negras and on a figurine from near Palenque (Blom, fig. 166, Gann 1926, opp.p. 242). This shows a standing woman, wearing a long skirt, carrying a dog, and leading a small male figure

---

8 See Appendix for detailed description of all specimens and their provenience.

with an adult face. The implication, borne out by other figurines (FM, PM Blom, p. 200) and stucco relief (Spinden, p. 51) is that of goddess and devotee. It is inadvisable, however, to try to associate this headdress with any one type of figurine, since, although there seems to be a regional distribution of some headdresses, they are seldom a constant element in any one type.

In considering the Form A heads with more elaborate headdresses, we find that they fall into sub-groups determined by technique. And in almost every sub-group we find a specimen that is duplicated in Tabasco to the northwest or the Highlands to the south.

Of four heads with applied fillets of clay added at the top (F21-24), two have the stepped hairdressing just described (Pl. XII, 4, 5). One of these with two fillets so interwined as to represent coils of hair on top of the head (Pl. XII, 4) is reproduced at Jonuta, in the local style, on a woman standing with raised hands (Spinden, Pl. 17, 7).

Then there are three heads (F25-27) with a perfectly plain, hoodlike headdress that gives a sugar-loaf shape to the high, flattened head, and fits in a curve around the face (Pl. XII, 7). This is found again in the Highlands (Spinden, Pl, 17, 5).

Of four heads moulded in one piece with their elaborate spreading headdresses (F28-31), two wear a puff-ball type of textile turban (Pl. XII, 3) that appears again in stone carving on Lintel 4 at Piedras Negras (Maler, Pl. XXXII), on painted pottery from the Highlands (Gordon 1928, Pl. II, VIII; Dieseldorff, fig. 138), and in clay on a figurine head from Lubaantun (Joyce 1926, Pl. XXV, XXVI). The other two heads referred to have as the main element in their headdresses an owl mask, found in varying forms in the costume of Maya figurines (Pl. XII, 12).

There are eight Form A heads with elaborate applied headdresses, (F32-39). The upper part of the head is usually more cylindrical than in those heads which have a stepped headdress; this may be to give a surer grip to the applied encircling fillets. Some specimens show the cloth foundation on which the headdress is constructed fitting to a smooth curve around face and high, flat forehead. Some have insignia applied to the forehead or the bridge of the nose.

A finely modelled head, with cruller-twist nose ornament, has around the face a crest that may represent feathers (Pl. XII, 11). Similar crests are on two heads from the lower Usumacinta (AM; Spinden, Fig. 209). Another head, badly broken, has at the top three short plumes (Pl. XII, 8); a similar head comes from Jonuta (PM). Another (F33) shows the remains of a hat with flaring brim and high conical crown that is found again at Yaxchilan (PM) and Chamá (Dieseldorff, fig. 39).

There are also nine Form A heads that do not fall into any special grouping (F40-48). Among these are a tiny head with no traces of hair or headdress (Pl. XII, 6); a broken one with a frill fitting squarely about the face (Pl. XII, 16); and one with very flattened forehead and holes where the ears should be, and a socket and groove at the top to fasten on a headdress of some other material (Pl. XII, 10). There are two heads that probably represent gods. One, in poor condition (Pl. XII, 13) recalls God D of the

carvings; the mouth with broken teeth is set in a grimace,the eyes in hollows, and a shallow depression across the forehead below the high cap-like headdress holds an applied symbol. A Chajcar figurine of a standing man has a similar head, with the addition of jaguar ears. The device in the forehead cartouche of the latter cannot be deciphered from the photograph. (Dieseldorff, fig. 174). The other head is a finely modelled portrait of Mam, the Old God, with projecting chin and cheekbones, Roman nose, and two snag teeth (Pl. XII, 14). The cylinder rising above the headdress is a socket; an examination of the very long neck suggests that the head fitted originally into the body that belonged with it, then later, after the body was broken, was set into plaster.

A head which is not strictly that of a figurine belongs here by virtue of its technique (Pl. XII, 9). It is hollow, and smoothly finished inside and around the bottom, probably having served as the lid to a miniature jar representing a man's body. Such a combination is found in plumbate ware (UM), and in the pottery of the Highlands of Guatemala (UM). It is the only head from Piedras Negras of fine light brown paste. The man wears very large crescent-shaped labrets at either side of his mouth, and a headdress that rises from a pleated fold around the face to a smooth crest at the top.

Headform B. Square, chubby face with spreading, flattish nose, beneath a normal, even bulging, forehead.

Neither of the two fairly complete figurines with Form B heads belongs to the varying types of fat old men with which this headform is almost always associated in the Maya area (F49-50). The more interesting of the two shows a standing man, between whose hands is a large, circular hollow, presumably for an inlaid disk (Pl. XIII, 30). This suggests a possible link between the late Chacmool figures on the one hand, and the "Archaic" stone sculptures of Copan and Miraflores (Lothrop 1926,b) on the other. The figure is small, rather columnar, and apparently was made in the form of a whistle, with mouthpiece, now broken off, projecting behind the feet. A hole for suspension perforates the head from side to side. Apparently the broken and useless whistle was discarded and used with sherds as foundation for stucco building decoration. The other figurine shows the head and bust of a man whose hands rest at his girdle, (Pl. XIII, 19).

Four heads seem to show a close hood, fitting smoothly around the face, like the hood-like headdress found with Form A heads (F51-54). Two of them (Pl. XIII, 18, 21) have heavy-lidded eyes under high-arched brows, and fat cheeks that suggest the Toltec Fat God (Beyer, 1930).

There are three hooded heads that have the sugar-loaf head pressed back to form almost a right angle with the face (F55-57). The large round eye-sockets show the under lid as well as the upper, giving the face a surprised look that pushes forward a fold of flesh over the cheekbones (Pl. XIII, 20). The hood comes down on the forehead in a point where some projection seems to have broken off; two of the three have at the base of the neck, just below the crown of the head, a round broken projection that may have served some functional purpose.

There are two heads of old men which may be included under the Headform B group (F58-62). One is a toothless old man with a high sloping head (Pl. XIII, 9), the other is a bald, round-headed old man with sunken upper lip (Pl. XIII, 7). A head with the startled eyes and pronounced cheek-bones described above has the fold of the upper lip so prolonged as to give the effect of a sweeping mustache, (Pl. XIII, 16). A cap-like headdress completes a picture of rather ferocious vigor.

Headform C. Broad, flat face, widest at the cheek bones, and pronounced, almost prognathous chin.

The only comparatively complete figurine in this group is a very fine specimen, of buff-brown clay (Pl. XIV, 7). Head and body were made separately, and the solid neck inserted in a hole in the trunk. The figure is that of a man, wearing a long-skirted loincloth, and a cape with applied textile decoration. The short head ends in a socket, presumably for a separate headdress. A similar figurine, with slightly altered costume, comes from near Roknimá in the Highlands (UM).

Three heads have hair parted in the middle and drawn down behind the ears (F66-68). This hairdressing occurs in Style X in Tabasco (PM) and British Honduras (Joyce, 1926, Pl. XXV), and in a local style in Campeche (JC); it is always associated with Form C heads. Wherever a head so dressed is attached to a body, the body is a woman's. Tabascan and British Honduran examples have coils of hair piled on top of the head in a manner that Landa described as a characteristic woman's hairdressing; it is assumed, therefore, that the heads described are those of women. One (Pl. XIII, 13) has a notch in the top of the head, and an undercut at the back similar to those noted by Saville as characteristic of the jades that he tentatively assigns to the Olmecs (Saville,1929). This is relatively flat and resembles similarly cleft heads from Teotihuacan (Gamio, 1922, I, Pl. 94).

Of five other Form C heads, only one is all well preserved (F69-73). This has a closely bound headdress wrapped in two broad horizontal folds (Pl. XIII, 22). A square medallion has a badly worn Form C head in the center (F71).

Miscellaneous. Among those figurines which cannot be assigned to one of the three headforms described as A, B, and C, are one complete figurine and two heads. The figurine (Pl. XIII, 8) is stylistically probably the earliest one we have from Piedras Negras. Since, although the badly weathered face seems to have been mould - made, the body is very crude and made by hand. It came from the fourth level of a test pit in the South Group and is the only figurine to be found so far below the surface, so according to test pit stratigraphy also, it is early. The body is pinched together hurriedly and apparently shows a woman holding a blanket across her chest with her right arm. A crude modelled figurine from British Honduras shows a seated person holding with his right arm a blanket across his face (Gann, 1900, Pl. XXXVII).

One head (Pl. XIII, 25) is grotesque, with the back smoothed vertically into a concavity that might have fitted over a finger or a stick; the other,

merely the top of a head (F76), is interesting only for the fact that it is the only head that is perforated for suspension from front to back, instead of from side to side.

Of the headless torsos (F77-90), some very fragmentary, the most interesting are two (F89-90) that show a woman in a low-necked gown, the sleeves of which fall from her wrists into long points (Pl. XIII, 26). Another such torso comes from Yaxchilan (PM). There is one complete figurine with such a body, probably from Campeche (JC). This has a wrinkled, bald head, too large for the body, set squarely on its shoulders. The garment is probably another version of the wide huipil seen on figurines executed in local styles in Tabasco and Campeche, but the figurines under discussion are distinctive, small, and finely made. Two other torsos (F82-83) one a woman's, are pierced for suspension from side to side through the arms just below the shoulder (Pl. XIII, 23). Another shows a man, probably old, judging by his heavy sagging body, and very thin arms, with hands clasped at his right shoulder, (Pl. XIII, 27). Others show variation in men's neckwear and in technique.

STYLE Y.

Three broad, flat, solid heads (F91-93), moulded entire, head, headdress and earplugs, in red clay, are a conventionalized product quite different from any other figurines at Piedras Negras (Pl. XIII, 28, 29). Superficially they much resemble flat figurine heads from the Valley of Mexico. The face is the same as that described under Headform C. Two of the three have, as main element in the wide squared headdress that frames the face, a twisted roll of textile that appears elsewhere only with Form C heads in local styles of the Highlands (MAI), Campeche (JC), and the Uloa Valley (PM). The head of the figurine from the Highlands on which this headdress element occurs bears a distinct resemblance to the two specimens from Piedras Negras, although cruder and probably modelled. A figurine with a similar head comes from the upper level, presumably Aztec, at Texcoco (Peñafiel, Pl. 105).

Human Figurines, Modelled

The two heads (F94-95) conforming to modelled technique seem archaistic rather than archaic; the only well-preserved one is a grotesque, whose raised eyebrows, staring eyes, and open mouth register shock and surprise (Pl. XIV,8). The face is framed in a short, rounded beard and a crescent headdress. Two other such heads are known:- one, mould-made, in orange clay, from the Uloa Valley (PM), the other, crudely modelled and smoke-blackened, from the Highlands (UM). On the latter the face is framed by animal jaws, and it is possible that these jaws have in the other two heads become beard and headdress by the process of substitution. We know that the human head in animal jaws was an important motif in Central American art.

Animal figurines, mould-made,-Style X

The few complete animal figurines that we have are all whistles, with mouthpieces projecting horizontally from the back of the effigy. There are two portly standing owls (Pl. XIV, 6: F99) of a type found again at Naranjo (Gann, 1925, opp. p. 88), and Nakum (PM). There are also two small owl heads (Pl. XIII, 17; F102). There is an association of the Moan bird with death, and frequent appearances of the bird in codices, but no more definite clue to his exact place in Maya theology. Among Maya figurines in Style X there is a type of standing man in owl mask and costume (MAI), and also a conventionalized owl headdress. These extend from the lower Usumacinta north into Mexico, but so far neither has appeared at Piedras Negras. The bird itself, however, occurs among figurines; as the motif in the only two pieces of modelled pottery so far found, a polychrome effigy lid, and a black bowl with a bird face on the side; and, conventionalized, in stone carvings. It is evident, then, that the owl was a bird of distinct importance in the Old Empire.

There was also a complete, smiling, raccoon (F100), a complete creature that may be an agouti (Pl. XIV, 5), and a dog's head and collar (Pl. XIII, 14), all finely made.

A jaguar-headed human figure with bent arms and a long necklace is moulded on the face of two smoother objects (Pl. XIII, 24; F104) that recall the effigy "handles" that stick up from the rim of a certain type of Toltec bowl (Linné, pp.114-15). These lack the opening that runs up through the Mexican "handles"; they are of very coarsely-tempered clay.

Animal figurines, modelled

A very interesting small modelled whistle shows a bird with two heads, a motiff of which representations are found as far south as Peru. These heads are in the full round and are set one behind the other, instead of side by side; legs and beaks are broken off, but large pellets form the eyes, the mouthpiece serves as a tail, and projecting folds of clay suggest the wings (Pl. XIII, 15). Two bird heads (Pl. XIII, 10, 11) and one possible duck head (F108) conclude the list of animals.

PERSONAL ORNAMENTS

Apparently, rich as well as poor persons made use of baked clay as material for personal ornaments; it is not necessarily a poor man's substitute for richer materials, since clay ornaments were found with Vault Burial 5, that of a personage who had the finest jade ornaments yet found in the city.

The clay ornaments in the vault consisted of a chain of round beads, of well-fired gray-brown clay, more or less perfectly shaped, varying in diameter from 1.7 to 2.5 cms. (M16). Two especially large beads have a diameter of 3.5 cms. With the same burial were several clay imitations of the Spondylus

limbatus shell (Pl. XIV, 2), of which natural shell quantities, worked to a greater or less extent, were found with this burial. Each clay shell has two holes at the narrow end, presumably for suspension from a garment. A fragment of a similar clay shell was above the burial among the sherds, presumably building debris, washed in when the vault collapsed.

Two cylindrical objects from the same burial (Pl. XIV, 1) suggest pottery imitations of the jade beads that project in threes from the ends of neck-bars and sides and bottom of amulet plaques. A perforation runs through the 6.6 cms length of the object but is blocked at the wider end, depressed in the center, by stucco that has been painted blue.

From the South Group comes a pendant made from a disk of polychrome pottery with a groove around the edge and graffiti on one side (Pl. XIII, 12).

Ear-ornaments include two fragments from possible earplugs (M 13, 14) of a roughly tubular type common in Mexico (Vaillant 1930, Pl. XL, XLI). They are of a fine light brown clay, well polished; one has an elaborate incised design on the outside (Pl. XIII, 4). Both of these were found in the excavations on Pyramid O-13.

An object shaped like a tiny flat-bottomed, flat-rimmed dish with a hole in the center was probably the back part of an earplug (Pl. XIII, 6). It was found in excavations of structures in the South Group. It is of a shape often found in jadeite, and such an earplug is often illustrated on hieroglyph heads, as for instance, one form of the head-variant for the number one, where a round oval bead projects from just such a dish-shaped frame. This ear ornament would seem to be a conventionalization of a flower.

These pottery ornaments were, with the exception of the pendant and, possibly, the tubular earplugs, undoubtedly painted, probably to imitate jade, shell or metal.

MISCELLANY

Miscellaneous objects of baked clay include the lower part of a human mask, practically life size (Pl. XIV, 10); a figurine mould of a seated woman, wearing a necklace and bracelets of long links, her head missing above the chin (Pl. XIV, 9, 11); and a fragment of a mould for feather decorations for a figurine or a vessel (M 11). There are spindle-whorls, three small and hemispherical (Pl. XIII, 5), one flat, and a number of disks cut from pottery (Pl. XIII, 2), that may have been used as counters for games. They range from polychrome to coarse unslipped ware, most of them with a diameter of three to four centimeters. One of them has a small circular depression in the center and eight others in a ring around it (Pl. XIV, 3). Another disk, crudely modelled, is convex on one side, with a concavity on the other just large enough to hold a small disk, convex on the side, flat on the other, that was found with it (Pl. XIII, 1). They show signs of having been fastened together, and may have been another type of conventionalized flower used in decoration. A probable pot-smoothing tool, now broken, was made from a potsherd (M19). There is a crude, roughly conical stand, with a socket in the smaller end, that has no clear purpose (Pl. XIV, 4). There are fragments of modelled, incised decoration from vessels or idols, a small moulded fruit that may be a pineapple, and a small curving jaguar paw, with a hole in the

palm, that may have been part of a censer (Pl. XIII, 3). A fragment of a tortilla Griddle (M 20) found with Burial 5 had stucco on it and probably belonged to the debris washed into the vault.

CONCLUSIONS

We have seen that the figurines and pottery objects from Piedras Negras show a developed artistic sense and a high degree of skill. These figurines are found throughout the strata of excavation, and there is no evidence of early occupation nor the early stage of craftsmanship such as is indicated at Uaxactun by crude, modelled figurines.

Style X and Y are wide-spread in the Maya area (Butler, 1935). Their occurrence at Piedras Negras stamps them as Old Empire, since there is no indication of occupation of that city during any other period. This accords with Thompson's findings at Lubaantun (Joyce, Clark, and Thompson, p. 312), and with the resemblances of Style X to Usumacinta stone carving, which belongs to a tradition of art that was swallowed up in the architectural emphasis of the Later Maya period. While Style X seems to be that characteristic of the Old Empire, and Style Y has some suggestions of outside influence, we cannot at present determine their interrelationship.

Headform A may be taken as typically Maya, and is represented in other forms of art; headforms B and C can be recognized also in stone reliefs, and may have historical significance, as yet undetermined.

Distribution of human figurines

(Heads and complete figurines)[9]

	WEST GROUP	EAST GROUP	SOUTH GROUP	SOUTHEAST GROUP	MISC. GROUP	TOTAL	APPROX. PERCENTAGE BY TYPES
Headform A	12	1	19	6	8	46	60
Headform B	2	2	5	1	5	15	20
Headform C	4	1	1	1	3	10	13
Style X	18(23%)	4(6%)	25(35%)	8(11%)	16(25%)	71	93
Style Y	3					3	4
Modelled			2			2	3
	21	4	27	8	16	76	100

Although less work has been done in the South Group than in the West or the East, it is this section that has the most figurines, since in adding torsos to the specimens tabulated, we have thirty-five for the South Group, eighteen for the West, nine for the Southeast, and seven for the East. The number of figurines from the Southeast Group is relatively large in view of

---

[9] It must be remembered that the Miscellaneous group, Style X, consisting of one complete figurine, two heads, and fourteen torsos, is not included in this chart. Nor are the two headless hunchbacks included, although they presumably have the A headform of the complete one.

the slight amount of work done there; their scarcity in the East Group and prevalence in the South is surprising. This could be due to a correspondence of the period of occupation of the East Group with a time when figurines were little used, or it could be due to the association of figurines with certain temples and not with others. We cannot apply specific dates to these figurines since they are not associated with dated monuments. Association with buildings and into Burial 5 gives us tentative datings, shown below.

Taking the city by sections, we find that in the East Group four figurines come from O-13, one from P-7, and two from a test pit.

Figurine types and ornaments in use before 9.16.0.0.0(?)

Form A head of Mam, Pl. XII, 14, Torso fragments, F78, 80. Agouti(?) Pl. XIV, 5. Tubular earplugs(?), Pl. XIII, 4; M13.	Found in debris under floor of O-13, dated approximately by Lintel 3, 9.16.10.0.0(?)

In the West Group there are examples of all types, with the exception of the Form B type with the right-angle head. Only in the West Group do we find the hooded Form A type, near the surface, and washed into the burial vault; and the flat red heads in Style Y, also near the surface. Six figurines are associated with J-3, four with J-23, one with J-6, and four come from test pits.

Objects probably in use at 9.15.0.0.0(?)

Pottery beads, M16. Pottery shells, Pl. XIV, 2. Pottery cylinder, Pl. XIV, 1.	Found with Burial 5/ which contains shell plates bearing the date 9.15.0.0.0(?)

Figurine types in use after 9.15.0.0.0(?)

Hunchback with Form A head, Pl. XII, 15. Hooded A head, F25. Dog Head, Pl. XIII, 14. Modelled bird head, Pl. XIII, 10.	In debris washed in above Burial 5.

Modelled and moulded grotesque and right-angle Form B heads are confined to the South Group. Here, fourteen figurines come from the debris on the steps of R-3 and R-2, sixteen from the Ball Court and the Ball Court Structures, R-11, and ten from test pits. The pottery found in connection with these structures is distinct in character, and is probably late.

Figurine types, ornaments, and objects probably in use near the end of the City's occupation.

Form A heads with stepped headdress, F8, 9, 12.
Form A head with hooded headdress, F44.
Form A heads with applied headdress, Pl. XII, 11; F34-37
Miniature Form A head, Pl. XII, 6.
Form A head of God D(?), Pl. XII, 13.
Miniature effigy lid of Form A head, Pl. XII, 9.
Form B head and bust, Pl. XIII, 19.
Form B head, partially perforated, Pl. XIII,21.
Right-angle B head, Pl. XIII, 20; F56.
Grotesque head, Pl. XIII, 25.
Torso fragments, Pl. XIII, 27, F81, 84, 85.
Torso fragments, perforated through the shoulders, Pl. XIII, 23; F82.
Modelled bearded head, Pl. XIV, 8.
Modelled round head, F95.
Owls, Pl. XIV, 6; F99.
Raccoon, F100.
Modelled duck(?) head, F108.
Modelled bird head, Pl. XIII, 11.
Disk earplug, Pl. XIII, 6.
Pottery pendant, Pl. XIII, 12.
Pottery ornament(?), Pl. XIII, 1.
Figurine mould, Pl. XIV, 11.

In debris from R-2 and R-3, which, from its position, is judged to be late. Those in the Debris from R-11, Ball Court Structures, are included here since the pottery from R-11 was similar to that from R-3. See Part I.

Forms A and C have been found in the Southeast Section, in the excavation of probable residences, six figurines coming from the mounds of the V-1 group, three from a small mound to the north of V-1.

A series of test pits was dug throughout the city, most of them in arbitrary levels of 40 centimeters each. These levels were counted from the top down, one, two, three etc. As stated in Part I, certain features suggested contemporaneity of the same levels in different pits. All of the small number of figurines found in test pits are shown below according to levels. No individual pit contained more than four figurines and none showed any sequential development of figurine types worthy of consideration.

Level IV

Figurine with apparently mould-made head, and crude, modelled body, Pl. XIII, 8.

Level III

Form A head with turban, F29.
Right-angle B head, F57.
Torsos: old woman, F77, man with neckbar, F88, animal(?), F86.

Level II

Hunchback with Form A head, F2.
Form A head with stepped headdress, F10.
Form B head, F52.
Medallion with C head, F71.

Level I

Form A head with stepped headdress, F11.
Hooded A head, Pl. XII, 7.
Form B heads, Pl. XIII, 9; F60.
Style Y head, Pl. XIII, 29.

While these tables, showing different types of tentative dating, are interesting, and complementary to each other they are not particularly significant, partially because of the small quantity of material represented by them, partially because of the nature of that material. Almost all the figurines from Piedras Negras are in one style of mould-made figurines that shows artistic and technical skill. The important factors from the chronological point of view are whether the city was settled by people who already possessed this kind of figurine; if not, when did they achieve it; how long did they make it; and are deviations from it historically important. The interrelation of various types contained in the prevailing Style X, is of little importance compared to these problems; the probability is that these types were all more or less contemporary.

So far as we know there was no slow development of figurine making at Piedras Negras. The people who settled the city had developed the art of making figurines in a mould to a fine point before they came, or received the knowledge full blown from the outside source at some time during their life there. The first alternative seems the more probable. The evidence just examined suggests that Style X figurines were used up to the end of the occupation of the city. The archaistic grotesque head and the modelled animal heads, none of which seems to have "Archaic" earmarks, are deviations that may have occurred at anytime. The only exotic idea is the Style Y heads; one would hope for a consistency in time levels in their appearances; as yet we have only one Style Y head that can be given even a tentative date.

In relation to the figurine problem, Piedras Negras figurines are important, establishing fine mould-made figurines as a feature of Old Empire culture. Although such figurines occur all over the Maya area, at no other site except Lubaantun, do they come from authentic excavations of a purely Old Empire site. The use of pottery jewelry is an interesting sidelight on the sophistication of the people.

In relation to the city, Piedras Negras figurines imply by their homogeneity of style a relatively short occupation of the site, when compared to Uaxactun, the only other Old Empire site in that general region where intensive digging has been done, and suggest that it was not settled until after the Maya "Archaic" period. This evidence agrees with that of the pottery.

In relation to other Maya sites, Piedras Negras figurines provide examples of types found along the Usumacinta from the Highlands to Tabasco.

The prevalence of mould-made figurines and the absence of "Archaic" ones at Piedras Negras and along the Usumacinta, and the scarcity of mould-made figurines and the appearance of "Archaic" ones in the Peten, added to traits like distinction in pottery types and distribution of stone relief carving, suggest that there may have been peoples in these districts whose cultures varied in their forms of expression, though fundamentally the same (see Thompson, 1932, pp. 198-203). For while the "Archaic" figurines at Uaxactun might mean merely an earlier settlement there than at Piedras Negras, the fact that the lack of mould-made figurines at the former city persisted through Cycle Nine, the period when Piedras Negras was producing mould-made figurines, points to a definite difference in taste or technical knowledge. One could say that the Peten people, with fine architecture and pottery, lacked the type of art interest that the Usumacinta people expressed so excellently by their figurines and stone reliefs.

NOTE ON FIGURINES RECOVERED IN 1933.

Outstanding figurines from 1933 include a small figure of the Diving God, with arms and legs broken off, a miniature Form B head, the same size as the tiny A head from 1932, and a figurine with moulded A head with stepped headdress. The body of this figurine is crudely modelled, showing a standing person with outstretched arms. It is the second such figurine, combining fine, mould-made head with crude, modelled body, to be found at Piedras Negras. Similar Toltec figurines come from the Valley of Mexico, (UM).

APPENDIX: DETAILED DESCRIPTION OF FIGURINES AND OBJECTS [10]

Figurines

F1 L-28-111	Hunchback figurine. Form A head. A cap lying in a straight line across the forehead, earplugs and the oblong neckbar hanging from a thong, are applied. The back of the whistle or figurine, originally painted blue, was broken away, probably the cause of its being discarded and used in foundation for stucco work. 7 x 3.9 x 3, Pl. XII, 15.	West Group. In debris fallen through into Vault Burial 5.
F2 L-28-147	Hunchback torso, breast, left hand, and neck ornament, a bar with beads at each end and hanging from it. 2.1 x 1.9 x 1.4	South Group. From ravine between Ball Court and O-12; 40-80 cms from surface.
F3 (26)	Hunchback torso, breast, left arm, and lower half of torso. 4.5 x 4 x 2.5	Location Uncertain. Number lost in the fire.
F4 L-16-892	Complete A head, stepped headdress, very flattened forehead. 2.8 x 2.4 x 3.3	West Group. Main terrace of J-3.
F5 L-16-968	Complete A head, stepped headdress and earplugs possibly applied, medial line incised, and not too straight. 4.3 x 3 x 3.8, Pl.XII,1.	West Group. In debris around J-23.
F6 W-6-2	Complete A head, stepped headdress, earplugs missing.	West Group. In debris around J-23.

[10] Three numbers, refer, in order given, to height, width and thickness from front to back. All are maximum measurements, with the exception of figurine heads; with these the height is measured from the top of the head to a backward projection of the chin line, the thickness from the chin to a downward projection of the top of the head. Two numbers refer usually to height and width; in the case of the spindle whorls and disks, to diameter and thickness. It is assumed that effigies are cast in a mould, unless otherwise stated.

F7 L-17-379	Form A head, broken off above lower line of stepped headdress. Left applied earplug missing. 3.2 x 2.6 x 3.7	West Group. From edge of first bench west of the West Plaza, near surface.
F8 S-1-11	Complete A head, stepped headdress, applied earplugs projecting at side. 4.4 x 3 x 3.9	South Group. Ball court at end of R-11.
F9 L-28-114	Complete A head, stepped headdress, medial line moulded, earplugs broken off. 4.5 x 3.2 x 3.1, Pl. XII, 2.	South Group. Between R-3 and R-2.
F10 S-7-2	Form A head lacking upper left corner and left earplug. Stepped headdress. Corners slightly rounded. 3.7 x 2.5 x 3	South Group. In wash between Ball Court and O-12, 40-80 cms below surface.
F11 S-7-6	Form A head missing above lower edge of stepped headdress. 2 x 2.1 x 2.7	South Group. As above within 40 cms of surface.
F12 S-11-2	Form A head, missing above lower edge of stepped headdress, the lowest corner of which covers the ears.	South Group. In debris around R-2.
F13 L-17-260	Complete A head, stepped headdress, very flattened forehead, and right shoulder with traces of blue paint. Medial line incised, and flaring sidepieces applied to the headdress. Earplugs missing. 4.3 x 2.7 x 3.5	Southeast Group. In humus near V-1 group.
F14 SE-1-4	Complete A head, stepped headdress, similar to L-17-260	Southeast Group. From rubble of step at north face of V-1.
F15 (1)	Complete A head, stepped headdress, very flat. 3.7 x 2.6 x 4.1	Provenience uncertain. Number lost in fire.
F16 (3)	Form A head, broken off below lower line of stepped headdress. 2.6 x 2.2	"
F17 (4)	Form A head, upper and left lower section of stepped headdress broken off. 2.7 x 2.1 x 2.6	"
F18 L-28-115	Complete A head, medial line moulded. Stepped headdress. Applied earplugs. 3 x 2.6 x 3	"

F19 L-17-348	Form A head, broken off above lower line of stepped headdress. Right earplug missing; left, and head above it show turquoise blue paint. Two applied fillets across the back of the neck, the upper one incised vertically with a blunt tool.	From river bank.
F20 M-15-1	Complete A head. Lower line of stepped headdress worn away.	West Group. Found in clearing the road to Tenosique.
F21 M-12-1	Badly weathered A head. Face gone.	East Group. From edge of first bench west of West Plaza, near surface.
F22 L-28-120	Form A head with face broken off below the eyebrows. Stepped headdress. Applied bands at the top implying elaborate dressing of woman's hair or wig. 4.2 x 2.8 x 3.5, Pl. XII, 4.	East Group. In wash from East Plaza.
F23 S-7-2	Badly weathered A head. The thick fold just below the top of the headdress may have been moulded in one with the head. 3.3 x 2.3 x 2.1	East Group. From the wash between the Southern Ball Court and O-12, 40-80 cms below the surface.
F24 L-17-290	Form A head; two parallel rolls form a turban perched on top of stepped headdress. 4 x 3 x 3, Pl. XII, 5.	Southeast Group. Near surface. Operation 2.
F25 W-17-1	Form A head with the face badly worn. Hood headdress. Top of head slopes down slightly from left to right, perhaps the result of exposure. 3.2 x 2.2 x 2.5	West Group. In first two meters below surface of Burial Vault 5.
F26 L-28-117	Form A head with rounded top. Badly worn face and earplugs. Hood headdress. 2 x 3 x 3, Pl. XII, 7.	West Group. East side of K-5 within 40 cms of surface.
F27	Form A head broken off above lower line of hood headdress. 3.4 x 2.1 x 3.2	Provenience uncertain. Number lost in fire.
F28 W-6-2	Form A head. Headdress a puff-ball type of textile turban, resembling that of Lintel 2.	West Group. In debris around J-23.
F29 L-28-132	Form A head. Broken off below the nose level. Buff clay. Headdress a turban like W-6-2. 3.4 x 3.3 x 2.8, Pl. XII, 3.	South Group. In the wash between the Ball Court and O-12, from 80-120 cms below surface.

F30 L-17-259	Form A head, with earplugs and owl mask headdress. 3.5 x 3.7 x 2.7, Pl. XII, 12.	Southeast Group. Under stone fill of terrace in plaza, V-1, group.
F31 L-17-284	Form A head, similar to L-17-259; another tier above owl mask. 5.5 x 4 x 3	Southeast Group. Near surface, operation 2.
F32 M-12-1	Form A head, broken below forehead.	West Group. In wash from West Plaza.
F33 L-28-118	Finely modelled A head, in sandy red clay. Applied nose crest, probable earplugs,and an applied stepped headdress that begins with a crest, possibly of feathers, above the face, and rises, through encircling applied fillets, to a broken top. 6.5 x 3.6 x 4.9, Pl. XII, 11.	South Group. In debris beside R-2.
F34 S-11-2	Form A head with face worn away, upper half of much flattened head gone, and the headdress, except down left side. Solid neck 1.3 cms long, presumably fitting into separate body. 4.3 x 3.3 x 6	South Group. In debris around R-3.
F35 L-28-119	Form A head with left earplug and most of headdress gone, nose and forehead crest badly worn. 4.8 x 2.7 x 3.9	South Group. In debris beside stairway of R-11.
F36 S-1-11(a)	Form A head with face missing below forehead; line of headdress foundation, decoration at sides and top remain. 3 x 3 x 2.1	South Group. In debris at end of R-11.
F37 S-1-11(b)	Form A head. The top of the headdress is all that remains on this fragment, broken at the same point as S-1-11(a). 4.8 x 2.2 x 2.3	"
F38 M-18-7	A very flat A head, of sandy red clay; lacks the left eye and left earplug and left half of the hat-brim that flares out above the face. Appliedbar and dots on the forehead. 4.8 x 2.6 x 6	South Group. Exact location unknown.
F39 L-17-17	A form A head with face broken away; left earplug, three plumes at top of head and part of headdress remain. 4 x 2.6 x 2, Pl. XII, 8.	Southeast Group. In rubble of step at north face of V-1.
F40 L-16-895	Form A head, with face finely modelled in buff clay, the half-opened mouth set slightly to one side below the nose. Two holes about .5 cm deep, where the ears should be. The very much flattened head, ending in a socket about 1 cm deep, had a deep groove around it about .7 cm from the top, probably to fasten on a headdress of some other material. 3.6 x 2.3 x 4.3, Pl. XII, 10.	West Group. From debris near Stela 40, J-3.

F41 L-16-970 — Form A head with nose broken off, and head, above the lower line of the headdress. An applied band showing a frill fitting squarely about the face, low over the eyebrows. Solid neck. 3.5 x 2.5 x 3.2, Pl. XII, 16. — West Group. From debris around J-23.

F42 L-16-97 — Fine A head showing an old man, probably Mam, the Old God, with projecting chin and Roman nose, his smile revealing his last two teeth in the corners of his mouth. He wears the remains of an elaborate applied headdress and large earplugs. The head is prolonged above the headdress into a socket 2.5 cms long, broken at the top; the solid neck is 3 cms long, the last 1 cm with remains of stucco. The original smoke-blackened, painted surface ends 1 cm higher, about the length of an average neck below the chin, suggesting that the head fitted originally into the body that belonged with it, then later, perhaps after the body was broken, was set alone into plaster. 9 (entire length) x 4 x 6, Pl. XII, 14. — East Group. From rear room, O-13.

F43 L-28-116 — Miniature A head; no traces of hair or headdress. 2 x 1.3 x 1.8, Pl. XII, 6. — South Group. Top of R-11a.

F44 S-2-15 — Form A head, with a hood-like headdress falling in folds over a close-fitting cap, which shows in front, where both rise away from the face to a point over the right eyebrow. 5.4 x 3.2 x 2.9 — South Group. From debris between R-3 and R-2.

F45 L-28-131 — This weathered A head recalls God D of the carvings. The mouth is set in a grimace, the eyes in roughly square hollows, and a shallow depression the length of the forehead below the high cap-like headdress holds a symbol, in relief. This, however, is not the kin sign one would expect for God D but seems to be a crescent holding two dots. 4.5 x 2.8 x 4.5, Pl. XII, 13. — "

F46 S-2-24 — Form A head, broken off below the nose, with the stepped headdress lacking the vertical line. It does not extend to the usual height; it is flattened, but very short, ending at the top in a straight line with a slight dip in the middle. 2 x 2.2 x 2.8 — "

F47 L-28-134 — Hollow A head smoothly finished inside and around the bottom; probably the lid to a miniature jar representing a man's body. Of fine clay fired to a high brown. Finely moulded face with applied ears and earplugs, large crescent-shaped labrets at either side of his mouth, and a headdress that has a pleated fold around the face and rises to a crest behind. 4.7 x 5.7 x 4.2, Pl. XII, 9. — South Group. From debris on top of R-11a, Ball Court.

F48 SE-1-38	Form A head broken off above lower line of headdress which runs straight across the forehead. Below it a square and two circles applied to forehead.	Southeast Group. Under stone fill of plaza near V-1 group.
F49 L-16-894	Figurine with B head. A standing man wears large, applied earplugs, an oblong neckbar, a loin cloth, and has a circular depression 6mms in depth, probably for inlay, between the hands resting at his waist. The figurine was originally painted blue, then stuccoed in such a way as to suggest its having been discarded and used with sherds as foundation for stucco building decoration. There is an old break where the whistle mouthpiece projected at the rear base. There is a perforation through the head from side to side, and part of the back of the head has been broken away on the left where the hole comes through. The stucco covered this break also. 6.8 x 3 x 2.6, Pl. XIII, 30.	West Group. From debris on J-3, near Stela 40.
F50 L-28-112	Form B head and bust. Head perforated; decoration at top and applied earplugs broken off. Hands resting above girdle. Two large beads held at throat by thong. 4.5 (to waist) x 3.3 (at shoulders) x 3, Pl. XIII, 19.	East Group. From surface debris on R-11a.
F51 L-28-121	Form B, head of buff clay, badly weathered. Perforation not complete. 3.3 x 2.3 x 3, Pl. XIII, 21.	South Group. From debris between Structures R-3 and R-2.
F52 S-10-2	Form B head, not perforated. Earplugs missing.	South Group. From ravine between Ball Court and O-12. 40-80 cms deep.
F53 L-28-122	Form B head with shallow holes, apparently an incomplete perforation, at side; heavy-lidded eyes under high arched brows; fat cheeks. Perhaps a version of the Toltec Fat God. 3 x 2.2 x 2.7, Pl. XIII, 18.	Provenience uncertain. Number lost in fire.
F54 L-17-383	Badly weathered B head modelled from crudely tempered brown clay. Eyes and bulging cheeks. 3 x 2.5 x 3.	From road to Tenosique.
F55 L-28-123	Right angle B head with face broken off at the nose. Projection at the back. Traces of blue paint on the face. 3.5 x 2.5 x 3.3, Pl. XII, 20	South Group. From debris in front of R-3.
F56 S-2-24	Right angle B head with face broken off below the nose. Projection at the back. 2.7 x 2.5 x 3.3	"

F57 S-7-3	Right angle B head. Chubby lower face. Traces of blue paint. 2 x 2.6 x 2.6	South Group. From ravine between Ball Court and O-12, 80-120 cms below surface.
F58 L-28-128	High, sloping B head of a toothless old man. Badly weathered, was painted blue. 3 x 2.2 x 2.7, Pl. XIII, 9.	West Group. From within 40 cms of the surface of Court 3, Acropolis.
F59 E-7-6	Perforated B head, no headdress. 3.5 x 2.1 x 2.5	East Group. Top of O.5
F60 L-28-124	Badly worn buff B head, flat at back as though it had been attached to something.	Southeast Group. Within 40 cms of surface, main terrace.
F61 (22)	Short B head, 2.3 x 1.7 x 1.8	Provenience uncertain. Number lost in fire.
F62 L-17-381	Form B head of bald, round-headed old man, with sunken upper lip. Buff clay. Recalls heads from Teotihuacan. 2.3 x 1.6 x 1.9, Pl. XIII, 7.	From river bank.
F63 L-28-130	Form B head with eye-sockets showing upper and lower lids; protruding cheek bones. Fold of upper lip so prolonged as to give effect of sweeping mustache. Cap-like headdress or hair creased by vertical parallel lines and encircled near top by applied fillet. 4.5 x 2.5 x 3.5, Pl. XIII, 16.	Provenience uncertain. Number lost in fire.
F64 L-17-196- -7	Figurine torso and C head, moulded separately in fine buff-brown clay, the solid neck inserted in a hole in the trunk. The right arm is missing, the left in full round outstretched, bent at the elbow, broken off shortly below it. These were applied to the body, as was the long-skirted loincloth, the upper edge of which rises on the sides almost to the armpits, and the elaborate textile cape. This was in strips or of a striped material, indicated by incised lines. A braided border edges it around the bottom, and is in turn edged by a further textile strip, marked off in squares. On the shoulders and in the middle of the back were medallions, the centers roughened for inlay. The head ends abruptly and squarely with a socket 1 cm deep in the top, and has a ridge with a slight groove beneath it across the back from ear to ear. The original surface had a low polish. Head, 2.6 x 2.6 x 2.5; whole 14 x 9 x 5.3, Pl. XIV. 7.	Southeast Group. Found about 1 m below the surface near Burial 1.

F65 L-28-127	Form C head like that of F64, lacking socket. Top of head apparently rounded from front to back. Stepped headdress very short. Ridge across back of neck slightly fluted. 3 x 2.6 x 2.5	Exact provenience unknown.
F66 L-16-671	Form C head, reddish brown, badly weathered, hair parted in the middle; a notch in the middle of the top of the head which is undercut in back, 1.3 cms from the top of the head, to a depth of .7 cms. Though the notch may have served to help fasten the head wherever it was attached, it recalls the similarly cleft heads from Teotihuacan. 3.4 x 3.2 x 2.4, Pl. XIII, 13.	West Group. Near plaza surface.
F67 L-28-133	Large heavy C head with flat surface, at back, of clay with which head and neck were fastened to some object. Face worn away; decoration gone from right side of head; hair parted in the middle. 4 x 5 x 4.1	South Group. Ball Court.
F68 (25)	Square C head. Hair parted in middle and drawn down to the ears. Badly burnt. 3 x 2 x 2.4	Provenience uncertain. Number lost in fire.
F69 L-28-126	Form C head with close headdress wrapped in two broad, overlapping folds. Traces of blue paint on headdress. 4.3 x 2.7 x 2.7, Pl. XIII, 22.	West Group. Platform north of J-3.
F70 L-16-890	Form C head broken off above forehead; features worn down; applied right earplug, left missing. 3.3 x 3.6 x 2.8	West Group. In debris on J-3
F71	Square medallion with badly worn C head in center. 2.9 x 2.4 x 1.6	West Group. From the West Plaza 40-80 cms below the surface.
F72 L-28-125	Form C head, with two applied bands meeting above the center of the forehead. 4 x 3.3 x 2	East Group. Southeast corner of the plaza.
F73 L-17-376	Badly weathered C head. 4.4 x 3.8 x 3.2	Provenience unknown.
F74 L-28-113	Complete figurine, of reddish clay. The badly weathered head may have been mould-made, with fine features; the very crude, handmade body shows a woman holding a blanket across her chest. 4.8 (entire height) x 2.4 x 1.3, Pl. XIII, 8.	South Group. From ravine between Ball Court and O-12; 120-160 cms below surface.
F75 L-28-129	Grotesque face with conventionalized wrinkles on forehead and cheeks, open mouth and protruding tongue. Back smoothed vertically into a concavity that might have fitted over a finger or stick. 4 x 2.6 x 2.2, Pl. XIII, 25.	South Group. From debris beside stairway of R-11a, 30 cms above floor.

F76 (24)	Top of a head with ring-forming hole for suspension from front to back. 4 x 1.8 x 2	Provenience uncertain. Number lost in fire.
F77 L-28-145	Torso fragment showing the pendent breasts of an old woman. 5.6 x 4.3	East Group. About 1 m below the surface of the plaza at the east side of K-5.
F78 L-16-34	Torso fragment, showing shoulders below a tight necklace of large beads, and a very short flaring cape tied with a flourish in front. This fragment is interesting technically, as the solid core of the neck continues down to project .7 cms below the under surface of the shoulders, showing that the figurine was built up by modelling the body onto the head. 9 wide at the shoulders.	East Group. Rear room, O-13.
F79 L-16-448	Man's torso, with traces of blue paint, and a necklace, fastening in front, that looks like a thong with one end looped over and hanging down. 3.5 x 4.2	East Group. Northwest rear room, P-7
F80 E-1-42	Man's torso, wearing cape and cuffs of large beads, right arm standing out from body.	East Group. Rear room, O-13.
F81 L-28-148	Torso fragment, showing a man grasping his left elbow with his right hand. 3 x 2.8	South Group. From debris at end of R-11
F82 S-2-11	Man's torso, right arm missing; pierced for suspension from side to side through shoulders. 4.6 x 2.6	South Group. From second terrace of R-3.
F83 L-28-144	Woman's torso, with perforations similar to F82. 4 x 4.2, Pl. XIII, 23.	South Group. From base of R-3.
F84 L-16-976	Man's torso, wearing a loincloth and a short plain necklace from which hangs a celt-shaped pendant. Projecting whistle mouthpiece at lower back. 12.5 x 11 x 9.4	South Group. Ball Court.
F85 S-1-13	Torso of seated man with thong-like necklace looped about his throat. Whistle mouthpiece at back is not perforated.	South Group. Ball Court. At end of R-11.
F86 L-28-108	Small, plump torso, presumably human, though it may have had an animal head; perforated whistle mouthpiece at lower back. 5.6 x 3.6 x 3.3	South Group. In wash between Ball Court and O-12; 80-120 cms deep.

F87 L-28-142	Torso, cleverly modelled in buff clay, of a man with hands clasped at his right shoulder. The heavy, sagging body and very thin arms probably depict age. 7.8 x 4.3, Pl. XIII, 27.	South Group. From debris between R-3 and R-2.
F88 S-7-3	Man's torso with oblong bar neck ornament. 4.5 x 2.7	South Group. From ravine between Ball Court and O-12; 80-120 cms below surface.
F89 SE-1-4	Woman's torso in long, flowing, low-necked gown.	Southeast Group. Operation 1.
F90 L-28-143	Woman's torso in long, flowing, low-necked gown, with sleeves falling from the wrists into long points. 4.7 x 4, Pl. XIII, 26.	Provenience uncertain. Number lost in the fire.
F91 L-28-137	Head with right side of elaborate headdress broken off. 4.2 x 4.7 x 1.7, Pl. XIII, 29.	West Group. At East side of K-5, within 40 cms of surface.
F92 L-17-380	Head with a headdress of which the main element is a twisted textile strip. 5.6 x 7.1 x 2.1, Pl. XIII, 28.	West Group. In western wash from plaza.
F93 M-12-1	Head with a headdress of which the main element is a twisted textile strip. 5.6 x 7.1 x 2.1	"
F94 L-28-135	A grotesque, bearded head, rising from a solid, bull-like neck. Headdress a crescent crest behind the raised eyebrows, which, with popping eyes and open mouth, register shock and surprise. Eyes are pellets with hole punched in the centre. Face was painted dark red. Partially smoke-blackened. 4.2 x 3.9 x 4.5, Pl. XIV, 8.	South Group. From debris beside stairway of R-11a, 30 cms above floor.
F95 L-28-136	Small round head, encircled above the forehead by an applied fillet. Features badly worn, left side broken away; eye apparently an applied pellet with incised horizontal line. 2.8 x 2.3 x 2.2	"
F96 L-28-138	Dog's head, broken, with collar that is moulded in one with the head in front, and continued in back by an applied fillet. Traces of stucco. 3.5 x 2.7 x 3.8, Pl. XIII, 14.	West Group. In the debris above Vault Burial 5.
F97 L-17-249	Figurine of a possible agouti, seated with front paws on his knees. Ears and neck pendant are applied, toes indicated by parallel lines pushed in from the edge of his feet with a fairly sharp tool. 6.6 x 3.4 x 4.9, Pl. XIV, 5.	East Group. Rear room of O-13.
F98 L-28-109	Figurine of a plump standing owl; shows traces of blue paint. 7.5 x 4.5 x 6.1, Pl. XIV, 6.	South Group. Near R-3.

F99 S-1-13	As F98, lacking paint, 6.7 x 4.5 x 4.4	South Group. At end of R-11.
F100 S-1-11	Figurine of a probable raccoon, standing, with front paws resting on his paunch.	South Group. At end of R-11.
F101 L-17-269	Owl head, incomplete, of buff clay. 2.5 x 2.9 x 2.5, Pl. XIII, 17.	Southeast Group. From the upper level of V-1.
F102 (27)	As F101.	Provenience uncertain. Number lost in fire.
F103 L-17-376	Standing jaguar-headed person, moulded on the face of a rounded oblong piece of clay, very coarse, used perhaps as ornamental handle to vessel. 10.8 x 3.6 x 3, Pl. XIII, 24.	Provenience uncertain. Number lost in fire.
F104 M-11-1	As F103.	"
F105 L-28-110	A crudely modelled whistle showing a double-headed bird, the heads set one behind the other. Legs and beaks are broken off. Large pellets form the eyes, a projecting fold of clay the wings, and the mouthpiece serves as tail. 4.5 x 3.9 x 5, Pl. XIII, 15.	West Group. From floor in front of niche, J-6.
F106 L-28-139	Bird head modelled in fine clay, the eyes round applied pellets. 3.2 x 2 x 2.5, Pl. XIII, 10.	West Group. In the debris above Vault Burial 5.
F107 L-28-140	Crudely modelled bird head, the eye an incised circle with a ring of dots punched around it. 2.6 x 1.9 x 2.9, Pl. XIII, 11.	South Group. From the debris beside the stairway of R-11a, 30 cms from surface.
F108 S-2-23	A crudely modelled fragment that may represent a duck. It has a flat projecting bill, and an eye made of an applied pellet with a hole punched in it.	South Group. From between R-3 and R-2.

Personal Ornaments

M1 L-28-157 a, b	A crudely modelled disk in brown clay, convex on one side with a concavity on the other just the size of a small disk, convex on one side, flat on the other, that was found with it, and shows signs of having been fastened to it. 4.5 x 7; 2.5 x .55, Pl. XIII, 1.	South Group. North Step, R-11a.

M2 L-28-153	A tiny flat-rimmed "dish" with a hole in the flat base. Of brown clay with a "float" surface. Probably part of an earplug. 3.5 x 1.3, Pl. XIII, 6.	South Group. From debris between R-3 and R-2.
M13 L-28-34	Polished, very fine light brown fragment of object which may be an earplug. Roughly tubular, flaring at end. Incised line parallel to edge outside. Incised lines at right angles to edge inside. 2.5 x 2.4 x.2	East Group. Beneath doorway pillar, O-13.
M14 L-27-176	As M13; engraved, elaborate design outside. 3.2 x 2.5 x .2, Pl. XIII, 4.	East Group. In front of third terrace, O-13.
M6 L-28-154	Disk cut from polychrome vessel, with a hole near the edge at a point where this is slightly flattened, and a shallow groove, on the narrow surface of the edge, that deepens on the flattened side to cut into the bi-conical perforation. A possible amulet, it has on both sides rude graffiti, one of which could be taken to represent a person with his left arm stretched across his chest. 3.4 ? x .7, Pl. XIII, 12.	South Group. From debris at end of R-11.
M16 L-27-16, 17	Beads, roughly spherical in form, of gray-brown clay. Tubular perforation .4 wide. Bead diameters vary from 1.7 to 2.5. Two have outer diameter of 3.5, inner diameter of 2.	West Group. With burial in Vault Burial 5.
M17 L-27-13, 14	Convex clay shells, roughly pear-shaped. Greatest width, 10; length, 12; thickness, .15. Two holes at the top, parallel to the edge, which have a concave depression between them. Lower edge is fluted. Traces of stucco or whitewash inside and of red paint inside and out. Pl. XIV, 2.	"
M18 L-27-15	Cylindrical object, 6.6 long, with flaring cuff applied to the final 1 cm. Diameter 1.5 at the smaller end, 2.3 at the larger. A perforation seems to run the length of it, but is blocked at the wide end, which has a central depression, by stucco, which was painted blue. Pl. XIV, 1.	"

Miscellaneous Objects

M4 L-28-158	Spindle-whorl, flattened, hemispherical, undecorated. 3 x 1, Pl. XIII, 5.	South Group. From the debris at the end of R-11.

M5 S-2-17	Spindle-whorl, perforated disk of unslipped, coarse ware. 5 x .5	South Group. From the debris between R-3 and R-2.
M9 L-17-219	Half of a flattened, hemispherical spindle-whorl, undecorated. 2.5 x 1.1	Southeast Group. West part of Room A, V-1.
M12 L-17-385	Spindle-whorl, hemispherical, undecorated. 2 x 1.1	East Group. From cache under floor of O-13.
M7 L-28-156	A large disk, cut from a coarse unslipped vessel, has on its inner surface, a central conical depression, .5 in diameter, .2 deep, with eight similar depressions in a ring around it. 6.8 x 9, Pl. XIV, 3.	South Group. From top of R-11a, north.
M19 SE-1-19	Probable pottery-making tool of negative-painted polychrome ware. Broken above rounded, oval end. 3.5 x 3.7 x .5	Southeast Group. From test pit near Burial 1.
M11 (28)	Fragment, bearing intaglio feather design. Seems to be the squared end of a mould for decoration to be applied to a figurine or a vessel. 5.2 x 4.2 x 1.3.	Provenience uncertain. Number lost in fire.
M15 L-28-151	Hand with incurved claws, presumably jaguar paw. Hollow, with hole in center of pad. Probably part of censer. 4.2 x 3.7 x 2.7, Pl. XIII, 3.	East Group. From cache under floor of O-13.
M3 L-28-152	Figurine mould, showing woman seated with her hands on her knees, wearing a necklace and bracelets of oblong links. The head is missing above the mouth. 8 x 7. Thickness of mould. 1-1.5, Pl. XIV, 11.	South Group. On steps of R-2.
M10 L-16-866	Lower part of a mask of thick reddish clay that had once been painted red. Shows mouth, chin, and half the nose. 10.6 x 2.5 x 2.2, Pl. XIV, 10.	Southeast Group. Above terrace floor, near stair, V-1.
M8 L-28-170	Crudely modelled stand, with flat base, of coarse brown clay. The shape is roughly that of a truncated cone, curving in slightly below the top, which has a socket 2 cms deep. 4.5 x 3.6, Pl. XIV, 4.	South Group. From top of R-11a, northwest.
M20 L-28-8	Fragment of flat tortilla griddle. Traces of stucco. 16 x 10 x 2	West Group. With Vault Burial 5.

BIBLIOGRAPHY

Baker, M. L.
Unpublished Paintings and Drawings of Maya Pottery. University Museum, Philadelphia, Pa.

Beyer, H.
1930. A Deity Common to Teotihuacan and Totonac Cultures. Proceedings Twenty-Third International Congress of Americanists, New York, 1928.

Blom, F., and La Farge, O.
1926-7. Tribes and Temples. New Orleans.

Boas, F.
1912. Album de colecciones arqueológicas, ilustraciones por Adolfo Best. Publicación de la Escuela Internacional de Arqueologia y Etnologia Americanas. Mexico.

Butler, M.
1931. Dress and Decoration of the Maya Old Empire. The Musuem Journal, XXII, 2. Philadelphia.
1935. A Study of Maya Mouldmade Figurines. American Anthropologist, 37, 4.

Dieseldorff, E.
1926. Kunst and Religion der Mayavölker, I. Berlin.

Frankfort, H.
1924. Studies in Early Pottery of the Near East. Anthropological Institute of Great Britain and Ireland, Occasional Paper 6. London.

Gamio, M.
1922. La Población del Valle de Teotihuacan. I. Mexico.
1926-7. Cultural Evolution in Guatemala and its Geographic and Historic Handicaps. Art and Art and Archaeology, V. 22, 6; 23, 1-3. Washington.

Gann, T.
1900. Mounds in Northern Honduras. 19th Annual Report of the Bureau of American Ethnology, Pt. II. Washington.
1918. The Maya Indians of Southern Yucatan and Northern British Honduras. Bulletin 64, Bureau of American Ethnology, Smithsonian Institution, Washington.
1925. Mystery Cities. New York.
1926. Ancient Cities and Modern Tribes. New York.

Gordon, G. B.
1925-6. Examples of Maya Pottery in the Museum and Other Collections. University Museum, Philadelphia.

Hirtzel, J. S. H.
1925. Collections d'Antiquités Guatémalteques du Musée d'Archéologie de l'Université de Gand. Proceedings Twenty-first International Congress of Americanists, second part, Göteberg, 1924. Göteberg.

Jijón y Caamaño, J.
1923. Puruha. Boletín de la Academia Nacional de Historia, VI. Quito.

Joyce, T. A.
1926. Report on the Investigations at Lubaantun, British Honduras in 1926. Journal of the Royal Anthropological Institute, LVI. London.

Joyce, T. A., Clark, J. C., and Thompson, J. E.
1927. Report on the British Museum Expedition to British Honduras, 1927. Journal of the Royal Anthropological Institute, LVII. London.

Linné, S.
1934. Archeological Researches at Teotihuacan, Mexico. The Ethnographical Museum of Sweden. New Series. Publication No.1, London and Stockholm.

Lothrop, S. K.
1926,a Pottery of Costa Rica and Nicaragua. Contributions from the Museum of the American Indian, Heye Foundation, VIII. New York.
1926,b Stone Sculptures from the Finca Arevalo, Guatemala. Museum of the American Indian, Heye Foundation, Indian Notes, III, 3. New York.
1927. Pottery Types and their Sequence in El Salvador. Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, I, 4. New York.
1933. Atitlan: An Archaeological Study of Ancient Remains on the Borders of Lake Atitlan, Guatemala. Publication 444 of the Carnegie Institution of Washington.

Maler, T.
1901. Researches in the Central Portion of the Usumatsintla Valley, Memoirs of the Peabody Museum of American Archaeology and Ethnology, II, 1, Cambridge.

Mason, G.
1928. Pottery and other Artifacts from Caves in British Honduras and Guatemala. Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, 47. New York.

Merwin, R. E. and Vaillant, G. C.
1932. The Ruins of Holmul, Guatemala. Memoirs of the Peabody Museum of American Archaeology and Ethnology, III, 2. Cambridge.

Noguera, E.
1935. Antecedentes y Relaciones de la Cultura Teotihuacana. El Mexico Antiguo, III, 5-8. Mexico.

Penafiel, A.
1890. Monumentos del Arte Mexicano Antiguo. Berlin.

Ricketson, E. B.
1934. Notes on the Pottery of the House Mounds of Uaxactun. In House Mounds of Uaxactun, Guatemala, by Robert Wauchope. Contributions to American Archaeology, 7. Preprint from Publication 436 of Carnegie Institution of Washington.

Ricketson, O. G. Jr.
1928. Report on the Uaxactun Project. Carnegie Institution Year Book #27. Washington.

Ridgway, R.
1912. Color Standard and Color Nomenclature. Washington.

Roberts, H. B.
Notes on Toltec Ceramics. MS.

Saville, M. H.
1929. Votive Axes from Ancient Mexico. Museum of the American Indian, Heye Foundation, Indian Notes, VI, 4. New York.

Seler, E.
1901. Die Alten Ansiedelungen von Chacula. Berlin.

Smith, A. L.
1932. Two Recent Ceramic Finds at Uaxactun. Contributions to American Archaeology, 5. Preprint from Publication 436 of the Carnegie Institution of Washington.

Spinden, H. J.
1913. A Study of Maya Art. Memoirs of the Peabody Museum of American Archaeology and Ethnology, VI. Cambridge.

Termer, F.
1930-1. Zur Archäologie von Guatemala. Baessler-Archiv, XIV, 4. Berlin.

Thompson, J. E.
1931. Archaeological Investigations in the Southern Cayo District, British Honduras. Anthropological Series, Field Museum of Natural History, XVII, 3. Chicago.

Thompson, J. E., Pollock, H. E. D., and Charlot, J.
1932. A Preliminary Study of the Ruins of Coba, Quintana Roo, Mexico. Publication 424 of the Carnegie Institution of Washington.

Tozzer, A. M.
1913. A Preliminary Study of the Prehistoric Ruins of Nakum, Guatemala Memoirs of the Peabody Museum of American Archaeology and Ethnology, V, 3. Cambridge.

Uhle, M.
1922. Influencias Mayas en el Alto Ecuador. Boletín de la Academia Nacional de Historia, IV. Quito.

Vaillant, G. C.
1927. The Chronological Significance of Maya Ceramics. MS. Thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Harvard University.
1930. Excavations at Zacatenco. Anthropological Papers of the American Museum of Natural History, XXXII, 1. New York.
1931,a Excavations at Ticoman. Anthropological Papers of the American Museum of Natural History, XXXII, 2. New York.
1931,b A Bearded Mystery. Natural History, XXXI, 3. New York.
1932a. Stratigraphical Research in Central Mexico. Proceedings of the National Academy of Sciences, XVIII, 7.
1932,b A Pre-Columbian Jade. Natural History, XXXII, 6. New York.
1934. With Suzannah B. Vaillant, Excavations at Gualupita. Anthropological Papers of the American Museum of Natural Histroy, XXXV, 1. New York.

Wardle, N. N.
Notes on Chiriqui Pottery. MS.

PLATE XII

Human figurines with Form A heads:

1. F5 Form A head, stepped headdress
2. F9 Form A head, stepped headdress
3. F29 Form A head, turban
4. F22 Form A head, coiled hairdressing
5. F24 Form A head, applied headdress
6. F43 Form A head, miniature
7. F26 Form A head, hood headdress
8. F39 Form A head, plume headdress
9. F47 Effigy lid, Form A head
10. F40 Form A head
11. F33 Form A head, applied headdress
12. F30 Form A head, owl headdress
13. F45 Form A head
14. F42 Form A head, Mam, the Old God
15. F1 Hunchback, seated, Form A head, back broken off
16. F41 Form A head

PLATE XII

PLATE XIII

Human and animal figurines, personal ornaments, and miscellaneous objects:

1. M1 Flower(?)
2. L-17-227 Polychrome disk
3. M15 Jaguar claw
4. M14 Carved tubular earplug(?)
5. M4 Spindle-whorl
6. M2 Earplug
7. F62 Form B head, old man
8. F74 Figurine, modelled, with moulded head
9. F58 Form B head, old man
10. F106 Bird head, modelled
11. F107 Bird head, modelled
12. M6 Pendant
13. F66 Form C head
14. F96 Dog head
15. F105 Double-headed bird whistle, modelled
16. F63 Form B head
17. F101 Owl
18. F53 Form B head
19. F50 Figurine with Form B head
20. F55 Form B head, "right-angled". Broken face on left
21. F51 Form B head
22. F69 Form C head
23. F83 Woman's torso, perforated from shoulder to shoulder
24. F103 Pottery object showing jaguar-headed man
25. F75 Grotesque head
26. F90 Woman's torso, clothed in long-sleeved robe
27. F87 Man's torso
28. F92 Style Y head
29. F91 Style Y head
30. F49 Figurine with Form B head

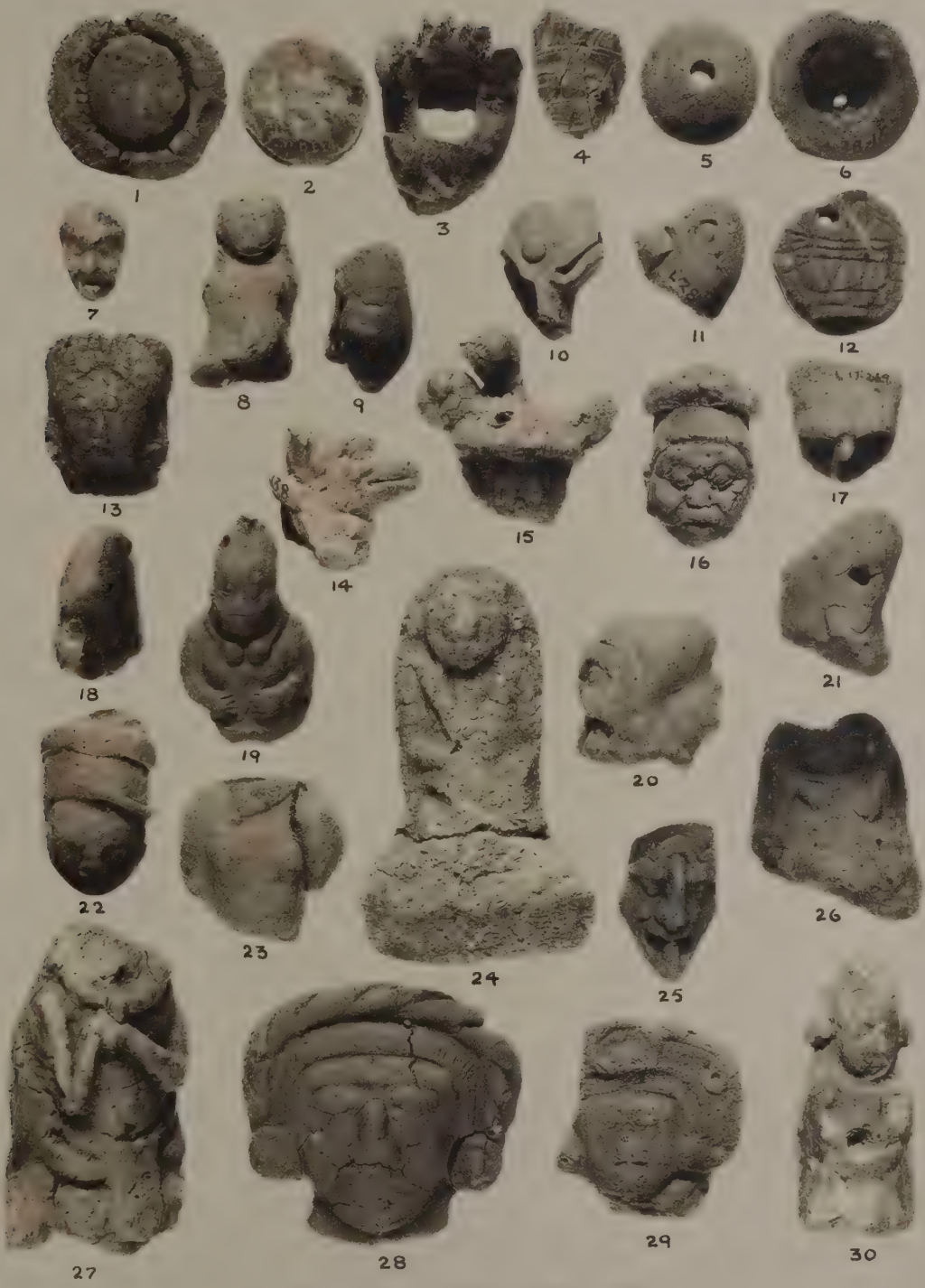

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

PLATE XIII

PLATE XIV

Human and animal figurines, personal ornaments, and miscellaneous objects:

1. M18 Bead(?)
2. M17 Shell
3. M7 Gaming disk
4. M8 Conical stand
5. F97 Agouti(?) figurine
6. F98 Owl figurine
7. F64 Figurine with Form C head
8. F94 Grotesque head, modelled, archaistic
9. Cast from mould M3; seated woman
10. M10 Mask
11. M3 Mould of seated woman figurine

PLATE XIV